

AMERICAN

FORESTS





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BELL TELEPHONE SYSTEM



AMERICAN FORESTS

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Editor-in-Chief
OVID BUTLER

Editor
ERLE KAUFFMAN

Associate Editor
LILIAN CROMELIN

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THE COVER
"Near the Top o' the World"
Western Ways Photo

American Forests

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THE
AMERICAN FORESTRY
ASSOCIATION

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The American Forestry Association, founded in 1875, is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute permanently to the welfare of the nation and its people.

In addition to publication of its magazine—AMERICAN FORESTS—designed to keep before the people of the country important conservation questions and issues, the Association carries on educational work in various fields including forest fire prevention, reforestation, protection of wildlife, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, advancement of forestry by private endeavor, the teaching of conservation in schools and the promotion of research in timber growing and forest utilization.

The Association is independent and non-commercial, and has no connection with any federal or state governments. Its resources and income are devoted to the advancement of conservation in the interests of public welfare, and all citizens are welcomed to membership.

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THE FOREST EXCHANGE . . .

In Defense of DDT

SIR: I was interested in Mr. Alexander Lincoln, Jr.'s reaction ("Forest Exchange," June issue) to "Fighting Tree Killers With DDT," by Henry S. Kernan (March issue). I had read Mr. Kernan's article and thought it to be interesting, pleasantly accurate, possibly a little over-enthusiastic. If Mr. Kernan had not over-enthused on the possibilities of an "insect-free forest" I doubt whether Mr. Lincoln would have registered such alarm. Personally, I cannot visualize our wanting an insect-free forest. Furthermore, it is quite unlikely that DDT would give an insect-free forest. DDT is not that encompassing.

However, I do not agree with Mr. Lincoln's suggestion that DDT ought not be used in the forest. It must, of course, first be established that DDT will do the job in question without un-

duly upsetting the balance of nature. But to accept the losses caused by the spruce budworm simply because we have always had outbreaks of spruce budworm when and if something like DDT can nip the outbreak in the bud, seems to be a step backward. Mr. Lincoln suggests that spruce budworm outbreaks be calculated as risk along with fire and windstorm. But consider our elaborate and costly fire detection and prevention set-ups. If we could feasibly control damage by windstorm we certainly would do so. If we can logically and economically control spruce budworm with DDT it would be a great step forward. Not to use, or at least not to try DDT in this instance for the reasons suggested, is too much like saying we shouldn't accept new developments in medicine since we got along without them before as a part of the natural or calculated—or uncalculated—risk.

I certainly agree that DDT should not

be accorded an unqualified welcome by biologists or ecologists for indiscriminate use in our forests. I also feel that the bulk of experimentation is being handled carefully and judiciously. We still have so much to learn about DDT's effects on the balance of nature and about the toxicology of DDT that it would be extremely unwise to use it indiscriminately. DDT was unfortunate in being over-publicized before it had adequate trial, and it is questionable whether it will measure up to its publicity. Nevertheless, it has great possibilities—and its possibilities in reducing losses in our forests from insect infestations should be thoroughly investigated. We are approaching the time when we may control some of the most detrimental insect and fungus infestations of valuable forests much as we can control these pests on our agricultural crops and on our ornamental plants.—Robert L. Krause, Wilmington, Delaware.

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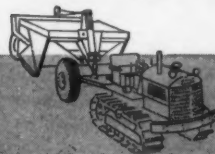
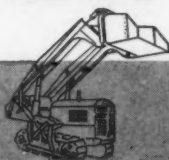
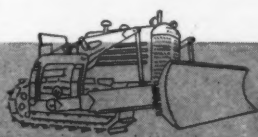
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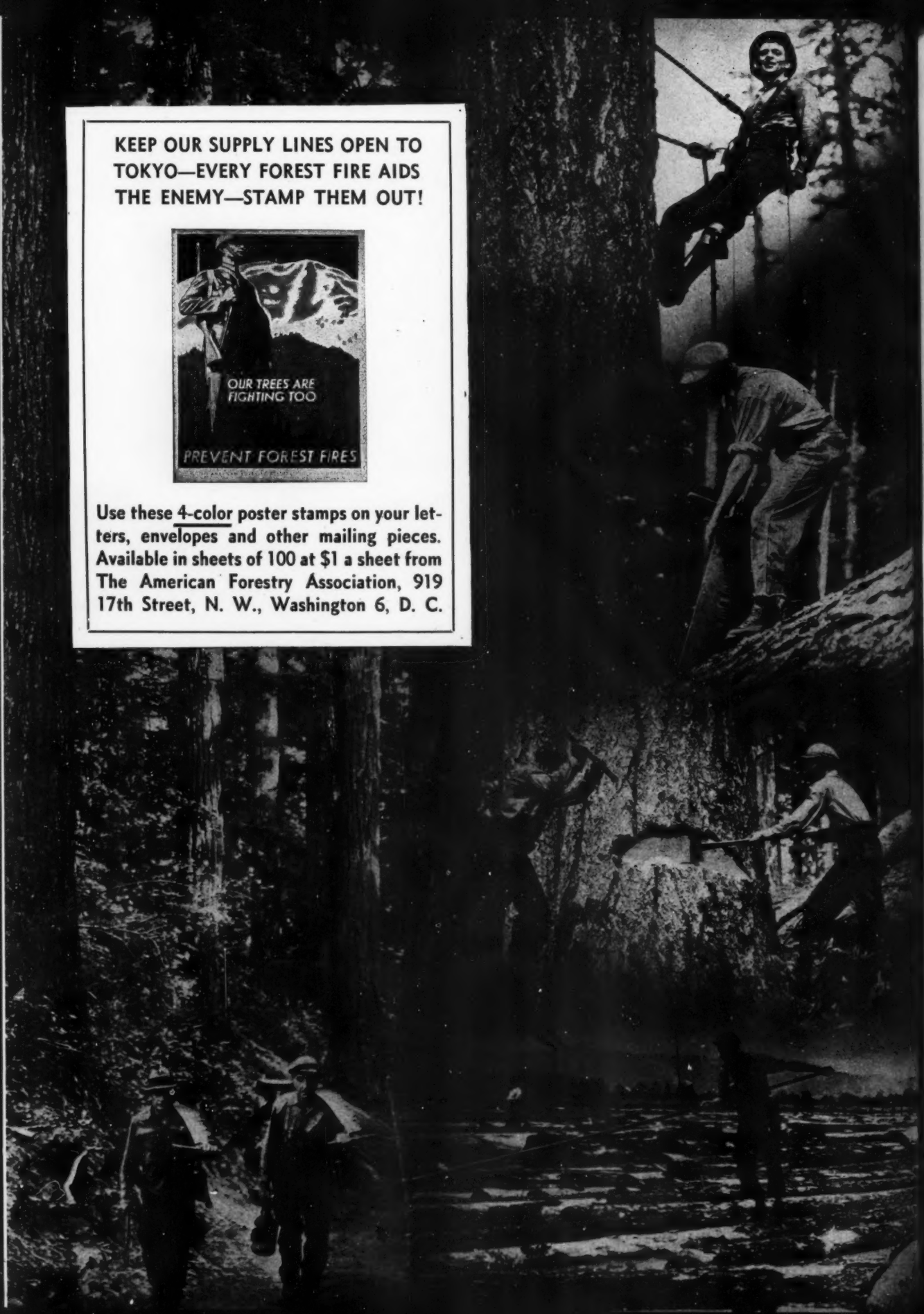
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My Favorite Tree

By JOHN EDGAR HOOVER

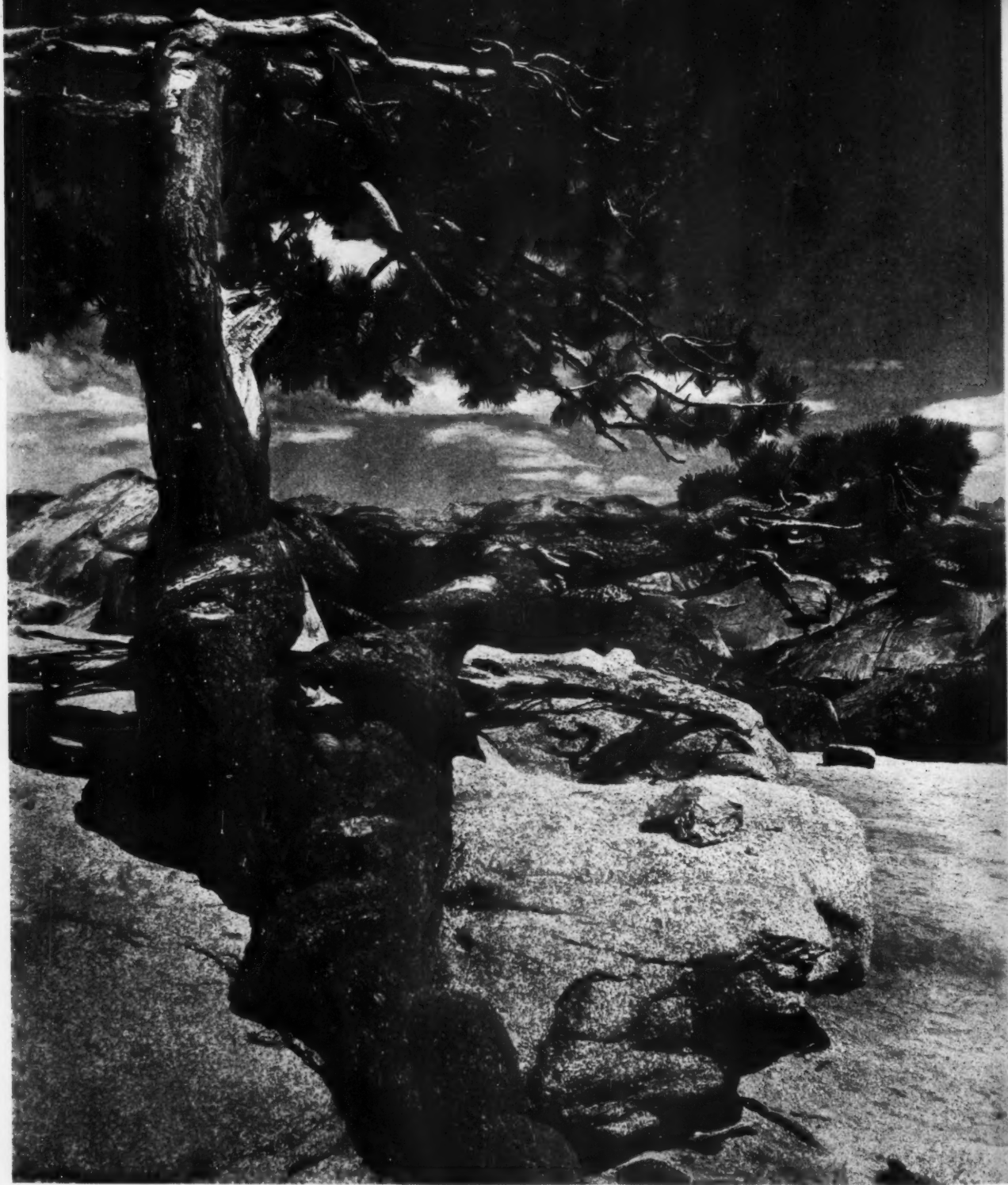
Director, Federal Bureau of Investigation
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OF ALL America's trees I find none more inspiring than the ageless redwood. To gaze for the first time upon its towering majesty has been one of the most soul-filling experiences of my life, for to me the redwood stands as a living monument to those qualities that have made our nation what it is today. All that is good and enduring in life itself seems symbolized in its tall, graceful trunk and rich foliage.

Adversity it takes in stride, for the redwood is endowed with a timeless stamina. Its bark is rich reddish brown, fibrous and furrowed—like the weathered leather of some pioneer's face. With buttressed base and deep-burled roots it meets the challenge of the centuries. Seemingly it thrives on hardships; its indestructibility is almost spiritual.

For all of its awesomeness the redwood is a friendly tree. With calm and dignity it keeps watch over the surrounding country, yet at the same time nurtures the lush carpet of ferns and other forest life growing at its feet. For all this I am truly grateful that man, after his years of unthinking wastefulness, has now befriended this fine tree. I am glad that others will have an opportunity to know the redwood as I have.



Timberline Sentinel . . .

Jeffrey Pine, Yosemite National Park

EDITORIAL

LUMBER PATTERN FOR THE PACIFIC

IT WOULD be a tragic mistake to misinterpret the news (see page 383) that Europe can supply, for the time being at least, most of the lumber needed for rehabilitation as well as for redeployment of our troops. To those beset by problems of supply, this happy circumstance is like manna from Heaven, but any notion that it means the passing of the lumber crisis and the end of war's heavy drain on our forests is as unrealistic as it is dangerous. The cold fact is that military needs for lumber have never been so great, nor so urgent. And never during the course of the war has the lumber supply problem been so critical.

The significance of the favorable situation in Europe is that we now can dedicate the great bulk of our lumber production to the primary task of bringing Japan to unconditional surrender in the shortest possible time. Less than three percent of production now need be sent across the Atlantic, as compared to the enormous military demand before Germany's collapse. Furthermore, it means that billions of dollars' worth of American fighting equipment and supplies now in Europe will be transferred to the Pacific boxed and crated in lumber produced by continental forests, mainly German forests.

The value of this credit to our war lumber economy is only too apparent. What may not be so clear to Americans is why, in view of these savings, heavy demands on our forests must continue — why our lumber situation three months after V-E day is so critically acute.

To say the gap between lumber supply and requirements has grown to alarming proportions is to oversimplify the situation. It is that—and more. A deficit of 8,000,000,000 board feet already is conceded for 1945 and unless there is a radical upswing in production during the next five months the figure may exceed that of any previous war year. Military planners are seriously concerned over this irretrievable loss, which already has robbed them of possibly one-eighth of the lumber needed this year for the conduct of the Japanese war, because in coming operations lumber, to use the Army's own words, will be "almost on a par with ammunition as a combat essential." The deficit

is equally serious to those responsible for supply, the lumber producers, for it means, in the face of skyrocketing demands, the type of pressure that easily could lead to damaging relaxation, if not collapse, of cutting practices essential to any workable form of forest management.

Because few realize the conditions that confront us in the Pacific and Asiatic theaters of operation, it is enlightening to review the Army's concept of lumber's part in the climactic campaigns ahead. Up until now, because of the island-to-island character of warfare and the employment of giant convoys as virtual floating bases, large quantities of lumber have been neither available nor necessary. But as combat troops are hurled against the enemy's home coasts, whether it be China or Japan proper, they must be supported by mammoth bases combining the triple functions of shipping, industrial and housing centers. Unlike the European theater, where England with its modern harbors, unloading and warehousing facilities, maintenance and repair shops and adequate housing was ready and waiting to serve as a major base for our operations, we must start from scratch in the Pacific. This is why the building of bases, to use the Army's estimate, will require a lumber total greater than that necessary to duplicate in wood a city the size of Chicago.

But this is only one phase. Every piece of equipment for the operation of these bases, from screwdrivers to giant cranes, must be boxed or crated and shipped from the United States in what the Army terms "the greatest mass cargo movement ever attempted." Actually, it seems, we will be shipping into the Pacific enough machinery to duplicate the industrial facilities of England on which we were able to rely throughout the European campaigns. All of it, whether heavy presses or delicate precision instruments, will require lumber's protection en route.

These new demands, of course, will be accompanied by increased requirements for lumber to be used in boxing and crating combat materials. And lumber must go forward with the advance of our troops, perhaps in heavier volume than it was ever used in Europe. Bridges alone will be a major factor, for even

though the Japs leave all existing structures standing, which is unlikely, oriental bridges are not built to sustain or handle the weight of metal we shall move over them.

The burden of supplying this unprecedented lumber demand rests totally on American forests and American mills. Measure this against a conceded deficit of 8,000,000,000 board feet for the year and a current production level ten percent under 1944, and the reason for the present crisis in lumber becomes clear. So does the answer to any suggestion that the favorable situation in Europe will relieve this burden.

But it does not answer the question the generals and admirals are asking right now—"Can we get the lumber we need—when we need it?" It does not answer the industrialist worrying about transition from wartime to peacetime economy. It does not answer the lumber operator struggling in a labyrinth of difficulties to keep trees falling and mills running. Nor does it answer the forester concerned with the delicate task of balancing war drain with the producing power of our forests.

The House Select Committee on Small Business recently investigated the production situation and came up with the conclusion that manpower and equipment shortages constitute eighty percent of the problem (see July issue), and that if these are overcome "a possibility exists, not only of halting the decline in production, but of actually increasing the rate very considerably." Clearly the removal of these "deterrents to production" is not simple—in fact, it looms so complicated by Washington's bureaucratic processes that the committee virtually eliminates possibility of success unless "power to issue directives to all agencies concerned" is obtained for the present Inter-Agency Committee on Lumber.

If this, or its equivalent in a lumber czar, will give the generals and admirals the lumber they need to end the war in the Pacific, we are all for it. For frankly, we tremble at the thought of what might happen if the committee's suggestion that we may find it necessary to depart from the principle of sustained yield on national forests and other lands is misconstrued and pushed too far.

THE GREEN LAGOONS . . .

By ALDO LEOPOLD

Drawing by H. Albert Hochbaum

IT IS the part of wisdom never to revisit a wilderness, for the more golden the lily, the more certain that someone has gilded it. To return not only spoils a trip, but tarnishes a memory. It is only in the mind that shining adventure remains forever bright. For this reason, I have never gone back to the Delta of the Colorado since my brother and I explored it, by canoe, in 1922.

For all we could tell, the Delta had lain forgotten since Hernando de Alarcon landed there in 1540. When we camped on the estuary which is said to have harbored his ships, we had not for weeks seen a man or a cow, an ax-cut or a fence. Once we crossed an old wagon track, its maker unknown, and its errand probably sinister. Once we found a tin can; it was pounced upon as a valuable utensil.

Dawn on the Delta was whistled in by Gambel quail, which roosted in the mesquites overhanging camp. When the sun peeped over the Sierra Madre, it slanted across a hundred miles of lovely desolation, a vast flat bowl of wilderness rimmed by jagged peaks. On the map, the Delta was bisected by the river, but in fact the river was nowhere and everywhere, for he could not decide which of a hundred green lagoons offered the most pleasant and least speedy path to the Gulf. So he traveled them all, and so did we. He divided and rejoined, he twisted and turned, he meandered in awesome jungles, he all but ran in circles, he dallied with lovely groves, he got lost and was glad of it, and so were we. For the last word in procrastination, go travel with a river reluctant to lose his freedom in the sea.

"He leadeth me by still waters" was only a phrase in a book until we had nosed our canoe through the green lagoons. If David had not written the psalm, we would have felt constrained to write our own. The still waters were of a deep emerald hue, colored by algae, I suppose, but no less green for all that. A verdant wall of mesquite and willow separated the channel from the thorny desert beyond. At each bend we saw egrets standing in the pools ahead, each white statue matched by its white reflection. Fleets of cormorants drove their black prows in quest of skittering mullets; avocets, willets, and yellowlegs dozed one-legged on the bars; mallards,

widgeons, and teal sprang skyward in alarm. As the birds took the air they accumulated in a small cloud ahead, there to settle, or to break back to our rear. When a troop of egrets settled on a far green willow, they looked like a premature snowstorm.

All this wealth of fowl and fish was not for our delectation alone. Often we came upon a bobcat, flattened to some half-immersed driftwood log, paw poised for mullet. Families of raccoons waded the shallows, munching water-beetles. Coyotes watched us from inland knolls, waiting to resume their breakfast of mesquite beans, varied, I suppose, by an occasional crippled shorebird, duck, or quail. At every shallow ford were tracks of burro deer. We always examined these deer trails, hoping to find sign of the despot of the Delta, the great mottled jaguar, *el tigre*.

We saw neither hide nor hair of him, but his personality pervaded the wilderness; no living beast forgot his potential presence, for the price of unwariness was death. No deer rounded a bush, or stopped to nibble pods under a mesquite tree, without a premonitory sniff for *el tigre*. No campfire died without talk of him. No dog curled up for the night, save at his master's feet; he needed no telling that the king of cats still ruled the night; that those massive paws could fell an ox, those jaws shear off bones like a guillotine.

By this time the Delta has probably been made safe for cows, and forever dull for adventuring hunters. Freedom from fear has arrived, but a glory has departed from the green lagoons.

When Kipling smelled the supper smokes of Amritsar, he should have elaborated, for no other poet has sung, or smelled, this green earth's firewoods. Most poets must have subsisted on anthracite.

On the Delta one burns only mesquite, the ultimate in fragrant fuels. Brittle with a hundred frosts and floods, baked by a thousand suns, the gnarled imperishable bones of these ancient trees lie ready-to-hand at every camp, ready to slant blue smoke across the twilight, sing a song of teapots, bake a loaf,

brown a kettle of quail, and warm the shins of man and beast. When you have ladled a shovelful of mesquite coals under the Dutch oven, take care not to sit down in that spot before bedtime, lest you rise with a yelp that scares the quail roosting overhead. Mesquite coals have seven lives.

We had cooked with whiteoak coals in the cornbelt, we had smudged our pots with pine in the north woods, we had browned venison ribs over Arizona juniper, but we had not seen perfection until we roasted a young goose with Delta mesquite.

Those geese deserved the best of brownings, for they had bested us for a week. Every morning we watched the cackling phalanx head inland from the Gulf, shortly to return, replete and si-

The snow geese were gobbling gravel in the lagoons—gravel worth forty miles of flying



When the Delta of the Colorado Was a Blank Spot on the Map

lent. What rare provender in what green lagoon was the object of their quest? Again and again we moved camp gooseward, hoping to see them settle, to find their banquet board. One day at about 8 a.m. we saw the phalanx circle, break ranks, sideslip, and fall to earth like maple leaves. Flock after flock followed. At long last we had found their rendezvous.

Next morning at the same hour we lay in wait beside an ordinary-looking slough, its bars covered with yesterday's goosetracks. We were already hungry, for it had been a long tramp from camp. My brother was eating a cold roast quail. The quail was half-way to his mouth when a cackle from the sky froze us to immobility. That quail hung in mid-air while the flock circled at leisure, debated, hesitated, and finally came in. That quail fell in the sand when the guns spoke, and all the geese we could eat lay kicking on the bar.

More came, and settled. The dog lay trembling. We ate quail at leisure, peer-

ing through the blind, listening to the small-talk. Those geese were gobbling gravel. As one flock filled up and left, another arrived, eager for their delectable stones. Of all the millions of pebbles in the green lagoons, those on this particular bar suited them best. The difference, to a snow goose, was worth forty miles of flying. It was worth a long hike to us.

Most small game on the Delta was too abundant to hunt. At every camp we hung up, in a few minutes shooting, enough quail for tomorrow's use. Good gastronomy demanded at least one frosty night on the stringer as the necessary interlude between roosting in a mesquite and roasting over mesquite.

All game was of incredible fatness. Every deer laid down so much tallow that the dimple along his backbone would have held a small pail of water, had he allowed us to pour it. He didn't.

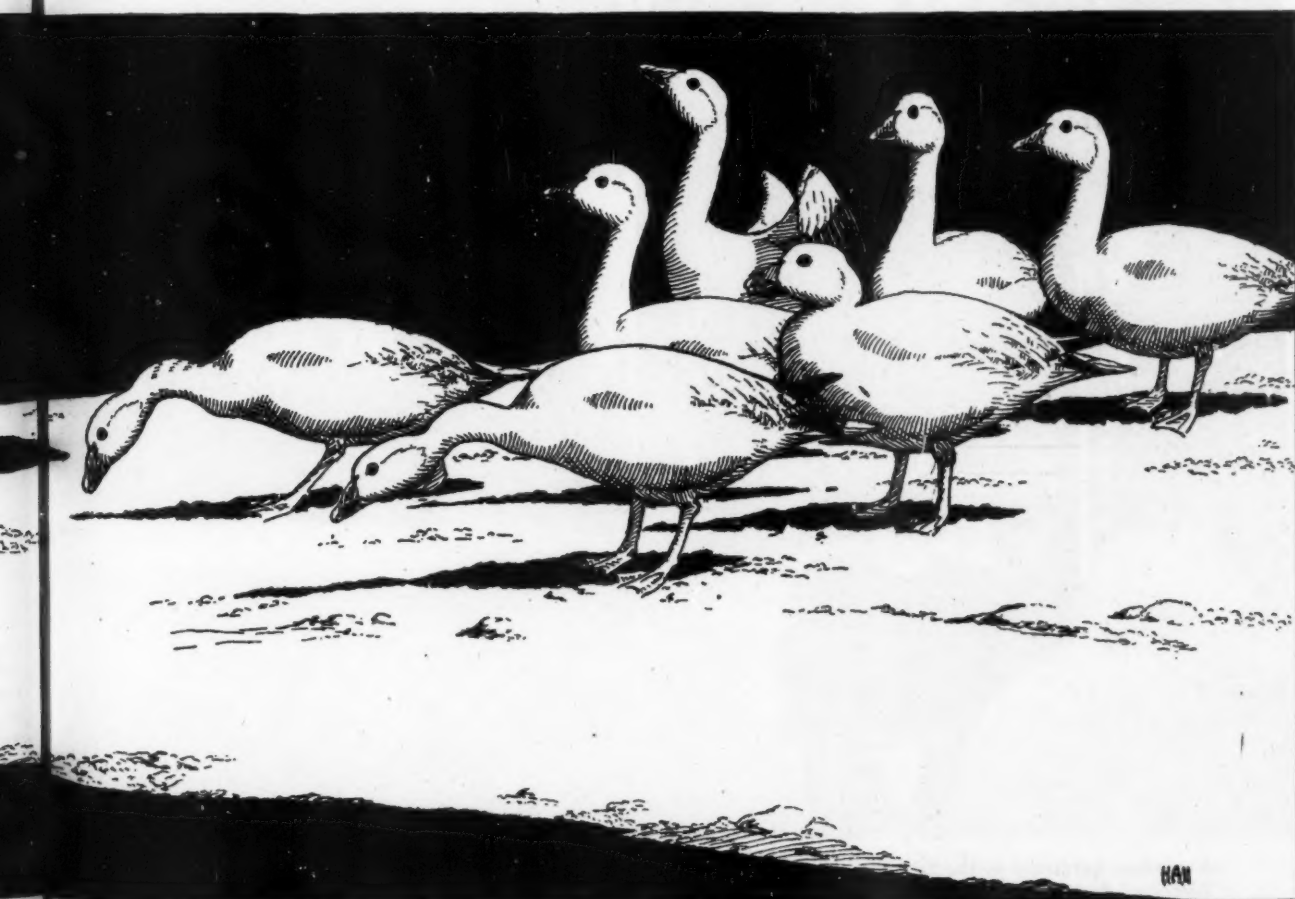
The origin of all this opulence was not far to seek. Every mesquite and every tornillo was loaded with pods.

The dried-up mud flats bore an annual grass, the grain-like seeds of which could be scooped up by the cupful. There were great patches of a legume resembling coffee-weed; if you walked through these, your pockets filled up with shelled beans.

I remember one patch of wild melons, or *calabasias*, covering several acres of mudflat. The deer and coons had opened the frozen fruits, exposing the seeds. Doves and quail fluttered over this banquet like fruit-flies over a ripe banana.

We could not, or at least did not, eat what the quail and deer did, but we shared their evident delight in this milk-and-honey wilderness. Their festival mood became our mood; we all revelled in a common abundance and in each other's well-being. I cannot recall feeling, in settled country, a like sensitivity to the mood of the land.

Camp-keeping in the Delta was not all beer and skittles. The problem was (Turn to page 414)



RUSSIA'S FORESTS

"WHAT about Russia's forests?"

This is the question many are asking today as the nations of the world measure the gigantic task of rebuilding war-torn Europe. And it is a pertinent question, for within the boundaries of the Soviet Union lies one-fifth of the forests of the world.

Little is known, of course, of their present condition, particularly in the war zones of European Russia, where destruction is believed to be serious. Thus, any picture of Russia's timber resources must be based on prewar information.

This places Russia's forest area at approximately 2,000,000,000 acres, twice that of Brazil and three times greater than that of the United States. Roughly three-fourths of the Soviet's

(Turn to page 404)



A reindeer herdsman in the far northern forests of European Russia, partly above the Arctic Circle



Glimpse into the southern maritime region. and spru



South of the Arctic tundra, a forest extends to the river. Much of it is unexplored, inaccessible



on. Spruce dominate the forests of eastern Siberia



forest extends across Siberia to the Pacific Ocean. This view is in western Siberia



Logger at work in a state forest near Archangel. Practically all forests in Russia are state owned



Typical scene in the Ural Mountains where European larch, along with pine and spruce, forms vast forests

WHERE SHALL WE FIND ENOUGH CELLULOSE?

By W. N. PIRKLE

This Is A Vital Question in View of the Promise of Wood Chemistry

THERE is a great deal of talk about developments in the field of wood chemistry after the war. Business men in particular herald with acclaim every new wood chemical product that comes from the research laboratory, and look hopefully to the future. But the economist and naturalist have a different slant. They know that wood chemistry, although a comparatively new field, has already increased the demands upon this country's timber resources. They know that even before the war, in 1941, the wood cellulose industry alone required nearly 10,000,000 tons of wood pulp, that this figure has jumped greatly under war production. Where, they ask, shall we find enough cellulose to meet expanding wood chemistry needs? New chemicals from wood represent a noble scientific achievement, but would it not be economic suicide to let all rivers run mud because of a denuded continental area?

A sixth of America's commercial forest land is already virtually non-productive. More millions of acres are producing only a fraction of potential capacity. Of the original virgin forest on this continent, but a mere vestige remains. And there is another angle. Coal and oil are the chief raw materials for the organic chemical industries of the world. Some day this nation's oil will run dry, its mineral wealth will become depleted, and so it may be necessary to go to the forest for motor fuel and innumerable other materials to keep the great cellulose industries operating. But if we go there, and find it bare, what

will be the consequences?

Common sense dictates that the United States must be made self-sufficient in the matter of cellulose. Can it be done? Before this is answered, it may be well to look a bit closer at this substance we call cellulose.

Because it is the chief component of wood, cellulose was one of the first raw materials to be utilized by the human race. The natural abundance of wood, along with its physical properties, made it an easy substance to appropriate. Thus wood has always been one of man's greatest weapons in the long conquest over the forces of nature.

Since it is easier to discover a use for something than to invent one, it was

only natural that the physical applications of wood preceded those that were chemical. That is why man discovered that a tree could be fashioned into a barricade or lean-to long before it occurred to him that it might be worked into a cathedral, or distilled to get such useful chemicals as fuel gas, turpentine, cymene, alcohol, acetic acid, creosote, tar and charcoal. The first wheel was doubtless a log of cellulose as it rolled down-hill, but the propeller of a P-39 is a cellulose chemical product which had to be fabricated in the modern laboratory. The textile industry was originated when the first man and woman "sewed fig leaves together," thus indicating that the first fibers were vegetable.

The savage might use cellulose just as he found it in nature, but civilized man invented chemistry and multiplied the uses of cellulose by learning how to make such specialized substances as the rayon yarns, smokeless powders and glucose.

The chemical possibilities of a tree are tremendous. Chemically, wood is made up on the average of about fifty-two percent cellulose, twenty-one percent hemicellulose, twenty-three percent lignin, and four percent extractives. The extractives vary in composition according to the wood species, but they usually contain resins, gums, dyes, tannins, medicinals, volatile oils and phytoosterols. Bark, especially that which is produced from certain species of oak, notably the chestnut oak, finds its greatest use in the tannin extracts and medicinals which it



As annual growth rings on this cross-section of loblolly pine indicate, trees grow fast in the South

yields, and does not serve as a source of cellulose. Cork oak trees produce a bark good for thermal insulation and bottle stoppers, but present day knowledge about what to do with pine bark is similar to that of the savage who roamed the forest without knowing what to do with cellulose.

Of all the chemicals which the tree yields, cellulose is the most abundant, followed by lignin and hemicelluloses. How to get cellulose out of wood in at least some degree of purity has been known ever since the Egyptians made papyrus from reeds of the Nile. But it was not until the development of the chemical sciences came about that wood was made to yield purified chemical pulps.

In a technical sense cellulose is the residue obtained from certain pulping processes. If pine chips, or any other coniferous chips, are placed in a steel digester and cooked with caustic soda and sodium sulfide, under steam pressure, the lignin, hemicelluloses and resinous substances are dissolved out, leaving a brown mass of insoluble fibers known in the trade as sulfate pulp. If this pulp is filtered from the mother liquor and washed free from caustic with water, a fairly pure grade of cellulose is obtained. In fact, the pulp is about eighty-five percent cellulose. If the wood is cooked with quick lime and a sulfurous acid solution, instead of the caustic mixture, the result is sulfite pulp, which is the kind much used in making newsprint. Soda pulp is made from broadleaf woods. The chips are cooked with caustic soda solution, and yield a soft, easily bleached fiber, which is used in the manufacture of book and blotting papers.

Chemically, cellulose is a carbohydrate akin to starch and the sugars, but it is also an alcohol and acts like one in much of its chemistry. The cellulose molecule is made up of many glucopyranose units combined together by beta glucoside linkages to make a long chain structure. The number of these units in a chain ranges between 100 and 3,000, depending upon the vegetable source and means of isolation.

The chemicals that may be extracted from wood are often substances of great value as such, but frequently they may possess much greater worth as source materials for new industrial products. For example, turpentine is a good medicinal and solvent just as it comes from the pine tree, but it may be converted into camphor, and the camphor plus cellulose derivatives into celluloid. Waste sulfite liquor, which is extracted from the tree as a by-product in making chemical pulp, was formerly emptied from the paper mill into a river. But

the "spent liquor" contained sugars, and the paper makers are beginning to convert it into "strong licker" by fermentation processes.

Cellulose as such may be worked into kraft paper or newsprint, or reacted with certain chemicals and changed into rayon yarn, cellophane, smokeless powder, or glucose. The products of cellu-

dred years before the discovery was applied with industrial success. Heinrich Scholler improved upon Braconnot's theory, and in the late 1920's announced a new process for the rapid and economical conversion of wood into a fermentable liquor. Thus another typical representative of the German ersatz chemistry came into being.



If trees are grown scientifically, says the author, a tenth of the South's total acreage can more than supply the cellulose industries

lose alone are so numerous that a diversified industrial set-up is required to manufacture them. There are milk containers, linoleum, shoe soles, organ tubes, car wheels, bandages, raincoats, water buckets, insulation, airplane fabric, twine, handkerchiefs, sausage skins and sugars, to mention a few.

The possibilities of producing commercial quantities of sugar from wood has been of special interest to engineers ever since the German chemist, Braconnot, discovered in 1819 that mineral acids would convert celluloses to monosaccharides. But it was almost a hun-

Wood sugar has its greatest value as a source material in making grain alcohol, which is a strategic war chemical. The United States needed 650,000,000 gallons of grain alcohol to wage war in 1944, and the same amount will be required this year. Alcohol is used in making rubber, explosives, medical supplies, plastics and textiles. Blackstrap molasses from the West Indies and starch from the grain belt could not produce the required volume of grain alcohol so a large plant is now being built in the Pacific Northwest to produce alcohol on a large scale from Douglasfir

waste, using an improvement of the Scholler process developed by the U. S. Forest Products Laboratory.

If sawdust or ground up slabs is put in a tile-lined steel cylinder and treated with repeated samples of one-half of one percent sulfuric acid, the celluloses present in the wood are changed into simple sugars, which subsequently are subjected to fermentation processes, which produce alcohol. A ton of Douglasfir yields about 1,000 pounds of sugar, or fifty-two gallons of 190 proof alcohol. But this is not all. After the cellulose from a ton of wood has been dissolved out to form sugars, there is 500 pounds of a brown powder left. The chemist calls it lignin, although he does not know as yet just what lignin is. In fact, he does not even know what to do with it when he gets it.

The Germans consider lignin as a worthless by-product, and so they burn it under the boilers as a fuel. Some say lignin is a good fertilizer, others claim that it is a good water softener, and a few have investigated its plastic-forming properties with some small degree of success. It is, however, not likely that the real value of lignin will be discovered until the structure of the lignin molecule is worked out. The chemistry of lignin is worth consideration since it is the second largest constituent of wood.

The value of wood has not only been increased by the chemicals that can be extracted from it, but also by the chemicals that can be put into it. For example, if green wood is soaked in a solution of urea, dried and heated to about 100 degrees centigrade, a chemical wood product results which can be bent, while still hot, into almost any shape. If wood that is impregnated with resin forming chemicals is heated, it becomes temporarily plastic, and can be compressed to one-half to one-third of its original size, yielding a material with high strength properties. This new substance resists the action of water and dilute acids much better than normal wood, resists decay, and termites practically refuse to eat it. Obviously, such substances as these have great industrial possibilities.

The key to this and all other wood chemistry developments, however, is the availability and continuing supply of cellulose. Will there be enough to meet all industrial demands? Notwithstanding past and present uses and abuses of its forest resources, it is easily possible to make the United States self-sufficient in cellulose. We have the land, the climate and the money. What is needed is an educated public.

To begin with, cellulose and all of its related substances can be taken from

many different botanical sources. For example, there are the seed hairs, like cotton, kapok, and milkweed floss. These fibers are nature's purest forms of cellulose and, next to wood, are the greatest natural source.

Then there are the bast fibers. These are the long fibers from the inner bark of various plants, such as flax, hemp, jute and ramie. The bast fibers yield pulps high in alpha cellulose, and are used in textiles and paper making.

Many of the vegetable fibers used in industry are obtained from the leaves of plants. The most important of these are the hard fibers extensively used for cordage, as for instance, abaca, sisal hemp, the bromelia fibers and caraoa.

Since cellulose is the chief component of the cell walls of higher plants, it naturally follows that the residual wastes from utilized agricultural plants form a huge potential source of cellulose. These materials include the cereal stalks, sunflower stalks, castor bean stalks, cobs, hulls from seeds, olive and peach pits, reeds, bamboo and bagasse. Bagasse is especially promising in its accumulative form from the crushed stalks of sugar and sorghum canes after the juice has been expressed.

It is estimated that the annual cellulose residues from agricultural crops in the United States will aggregate 173,000,000 tons on the dry basis. All of these plants, and many others, can be grown commercially in the United States, or in some of its island possessions.

The greatest natural source of cellulose in this country lies in the pines of the South. This is due to warm temperatures and a long growing season in that region—and to the vast land areas which will grow pines.

When the energy of the sun pours down to the extent of some 400 horsepower on every acre of land, it is captured by the chlorophyll in plant leaves, which subsequently takes carbon dioxide, water and minerals, and builds them into the great crops of nature. The chief chemicals produced in all of this complex chemistry are cellulose and lignin. The significant thing to note with respect to this is that the reactions forming these compounds take place at slightly elevated temperatures. It is generally known that open grown southern pine will grow large enough for pulpwood in six to ten years, depending upon the quality of the land. In the colder regions of the North, no such growth is possible. What is not so generally known is that an acre of Southern pine will produce about three times as much cellulose a year as an acre of cotton.

Several distinct species of pine are na-

tive to the Southeast. There is the slash pine, the "old field" or loblolly pine, the longleaf pine, the shortleaf pine, Virginia pine, pond pine and spruce pines, all commercial varieties. There are other species in lesser quantity and in restricted zones. But four types—slash, loblolly, longleaf and shortleaf predominate over at least 115,000,000 acres of the best pine land.

Among the Southern pines, slash grows the fastest, produces a great amount of turpentine and rosin, a good grade of lumber, and a white and durable pulp. The species is native to the South, adaptable to all southern states, but confined to a narrow strip of land along the coastal plane from North Carolina to southeastern Louisiana. Full utilization of the adaptability of the slash pine alone would go a long way in solving the cellulose problem. If the thousands of acres of good pine land in the South, now in gullies and sterile hillsides, were put to growing trees, pulp and paper imports from Canada and Scandinavia, which averaged \$222,000,000 a year before the war, could in time be greatly reduced—or even eliminated.

Longleaf pine has the same general adaptability as slash pine, and therefore can be grown in many parts of the South. There is a beautiful forest of magnificent longleaf pine on the 35,000-acre campus of the Berry Schools, high up in the mountains of northwest Georgia.

Loblolly and shortleaf pines are even more adaptable to soil and climatic conditions, and are found scattered over the South from tidewater Virginia to the scrub post oak hills of Oklahoma and Texas. All of the Southern pine species will produce pulpwood in ten to fifteen years under natural forest conditions. Cultivated, they will grow large enough for pulpwood in five to ten years, depending upon temperature and soil and moisture conditions.

Pine is not the only source of cellulose in the South. Sweetgum and tupelo gum are especially abundant. Gum pulps are soft, easy to bleach and are excellent for making book paper and newsprint. The states of Florida and Georgia alone could supply 34,000,000 cords of gum.

Before 1941, the pulp and paper industry of the world was using about 20,000,000 cords of pulpwood annually. The South can produce at least a cord of pulpwood an acre a year! So this means that the United States can be economically independent where cellulose is concerned. If trees are grown scientifically, a tenth of the South's total acreage would supply the raw materials for the cellulose industries and there would be enough left for the building trades and export!

LUMBER FOR EUROPE

U. S. Mission Finds Europe Can Supply Bulk of Lumber Needed for Rehabilitation and Redeployment If Chaotic Transportation Conditions Are Overcome

EXPORTS of construction lumber to Europe during the remainder of 1945 need not be more than two or three percent of United States lumber production, according to J. Philip Boyd, director of WPB's Lumber and Lumber Products Division, and head of a timber mission recently returned from Europe. This is slightly less than exports for the first part of the year, and about half the pre-war export figure.

In addition to Mr. Boyd, members of the mission were Albert C. Cline, chief of the program branch of WPB's Lumber and Lumber Products Division, and Arthur Bevan, chief of the Lumber Section of the Foreign Economic Administration.

Findings of the mission, which took part in an international timber conference on the distribution of European timber supplies, throw new light on requirements and their relation to United States' supplies, Mr. Boyd said. Despite chaotic conditions, sufficient appraisal of the situation was possible, he declared, to conclude that there is almost enough timber in Europe to take care of the most urgent rehabilitation needs and at the same time provide the wood required for redeployment of United States troops and supplies. However, he warned that the peak of construction needs in Europe will not be reached until the transportation system can be re-established, possibly early in 1946.

The largest single stock of lumber for use in Europe is in Sweden, Mr. Boyd said, but its transportation remains a major problem. The second largest supply is in Germany, where a considerable amount of lumber was discovered upon occupation of that country. However, the German railroads are almost completely demolished, and transportation of German lumber to liberated countries and England, for rehabilitation and redeployment use, is difficult. This situation may result in some temporary shortages, which may have to be met from United States supplies.

German forests, Mr. Boyd said, are not seriously overcut or damaged. In fact, some areas are in need of cutting. "If Germany's transportation system was anywhere near normal," he declared, "the United States would not have to send anything over for general construction. As it is, German forests, when we get mills working, may supply a good share of reconstruction lumber in Eu-

rope, as well as our redeployment needs."

The best softwood timber in Germany, he brought out, lies in the American zone of occupation. The British zone is comprised mainly of hardwoods. The famous Black Forest falls in the zone occupied by the French.

France, Mr. Boyd intimated, can provide her own immediate lumber require-

According to J. Philip Boyd, director of WPB's Lumber and Lumber Products Division, recently returned to this country after heading a special mission to take part in an international timber conference on the distribution of European timber supplies:

There is almost enough lumber in Europe to take care of urgent rehabilitation needs and for redeployment of United States troops and supplies.

If chaotic transportation conditions on the continent are overcome, U. S. lumber exports to Europe for the remainder of 1945 may drop to two percent of production.

Sweden and Germany have the largest stock of lumber for use in Europe. German forests, not seriously damaged, can supply a good share of lumber needed by war-torn countries. France should supply her own lumber needs, may help other countries. The situation in Russia and the Balkans is not known.

ments. Holland, Belgium and Greece, on the other hand, are in urgent need of help. The great need in these unfortunate countries is for roofing and flooring materials. England, too, needs large quantities of lumber for housing and other essential construction.

"The mission was greatly impressed by the necessity for prompt assistance," he said, "if suffering on the continent is to be reduced and chaos prevented during the coming winter."

If transportation problems can be overcome, Mr. Boyd declared, "there seems to be no need of increasing lumber exports to Europe and there is a pos-

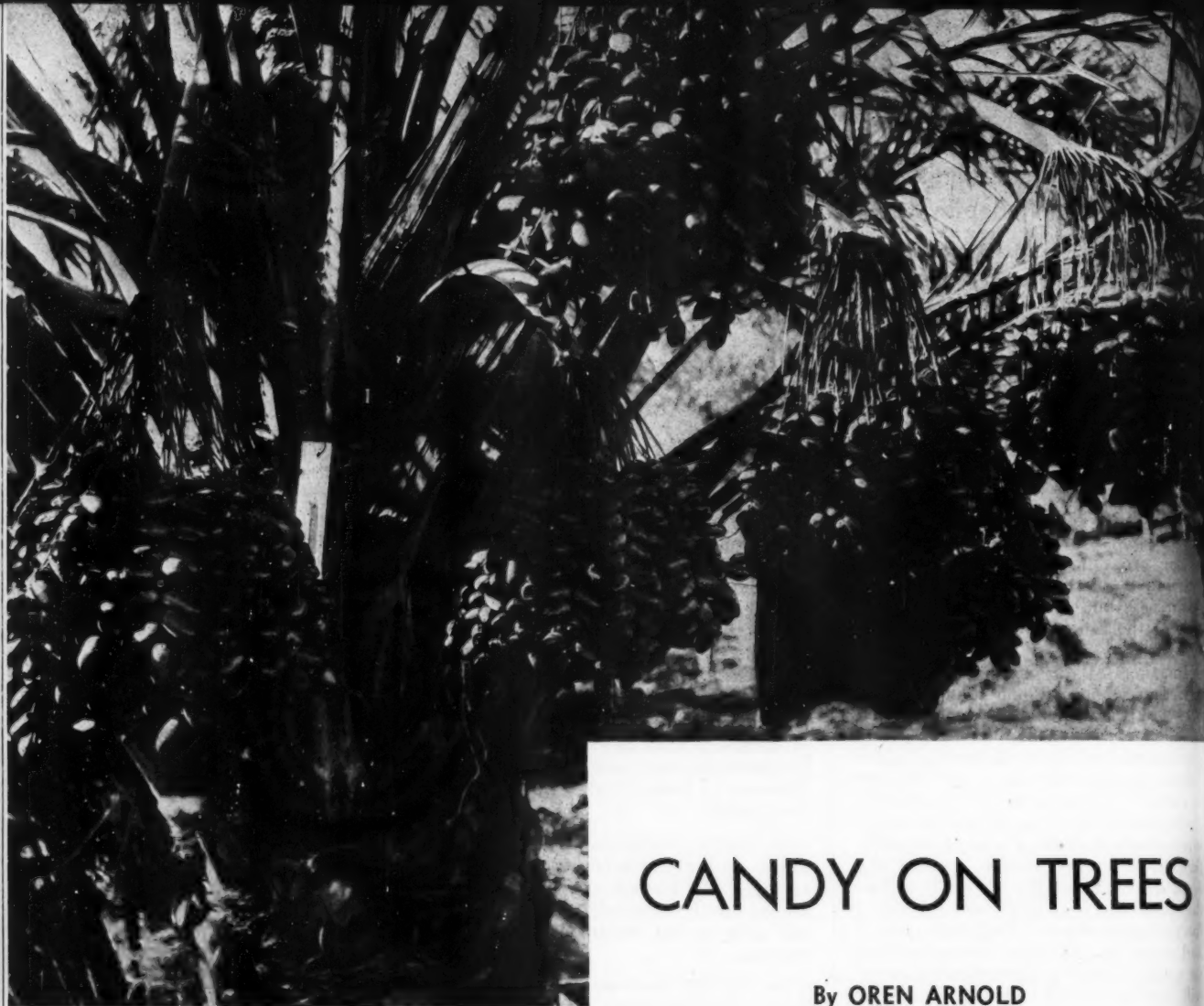
sibility that the export percentage can be decreased during the remainder of the year, particularly in the fourth quarter. The exception to this hoped-for decrease may be certain special industrial hardwoods not used in the building field. The Army is diligently working to restore the transportation system and is doing a magnificent job under the terrific handicap of almost complete collapse of transportation in Europe."

Easement of pressure on the United States' inadequate lumber supply by use of European supplies for redeployment and essential reconstruction will relieve this country of that burden and assist to that extent in providing lumber for prosecution of the Japanese war and in meeting essential domestic needs, Mr. Boyd pointed out. He emphasized, however, that even with the favorable European situation there will not be sufficient lumber immediately to satisfy all building needs in this country. Military requirements for lumber in the Pacific continue high and total requirements for the armed services have not diminished. Indeed, in some quarters it is pointed out that Army and Navy lumber requirements for fighting Japan alone will be greater than past requirements for a two-front war.

As to lumber production, the situation has never been more critical. The 40,000,000,000 board feet goal for military and essential civilian requirements for 1945 has been abandoned. Even the most optimistic do not expect a production figure in excess of 32,000,000,000 board feet, with some estimates as low as 29,000,000,000 feet. And production trends continue downward. Output for April was one percent lower than March, where there should have been a normal seasonal increase. Production during the first four months of 1945 was ten percent under the 1944 figure for the same period.

Greatest deficit is from the Southern pine region where production has been decelerating rapidly since August, 1944. Some mills are shut down entirely, while others are limiting operations. The reason for this critical situation, in the South and elsewhere, is given as lack of labor and equipment. Also some operators maintain they cannot operate at a profit under present OPA price ceilings.

WPB officials, as well as the Army and Navy, are frankly worried over the situation.



Date palms in Arizona—progeny of trees brought from the deserts of the Old World

CANDY ON TREES

By OREN ARNOLD

NOT long ago I climbed a ladder sixty feet high to eat some choice "candy" grown on an exotic tree.

The tree was one of many in a spectacular man-made forest. Each was thirty to seventy feet tall, each a slender, graceful trunk wholly without branches. Together they made a lacy canopy which, viewed from the ground, was like the vaulted ceiling of some great cathedral.

It is not far-fetched to envision many more of these incredibly beautiful—and valuable—forests in America, because in our Southwest we have the climate and the soil for them, plus the know-how and the successful tests. These candy forests are progeny of trees bought or stolen from deserts in the Old World—the age-old, storied dates.

For centuries, when an Arab ruler

wanted to show you routine courtesy he might send you a magnificent stallion, but when he wanted to show you the highest honor possible, he sent his rarest dates. Most of the western world has not fully appreciated or even suspected the superb quality of these fruits. They have the highest food value of any agricultural product in the world. A favored variety is called Khalasa—and the very word itself is Arabic for quintessence. The great King Ibn Saud until recently owned very nearly all the Khalasa date trees in existence—and kept them under armed guard.

Dates are still prized beyond any other food in Asia Minor and northern Africa, but the priceless Khalasa is no longer as exclusively Arabian as the Arab rulers would like. With customary audacity, Americans sneaked into Ara-

bia twenty-seven years ago and stole Khalasa offshoots for planting in this country. We have since built these and other date trees into gardens of extraordinary interest and beauty. Commercially they grow in the most unlikely regions imaginable—the arid "desert" of California and Arizona, with a negligible few in southwest Texas. They demand a dry heat with abundance of ground water, and only the irrigated desert areas can supply this.

Where they do grow, their great 100-pound clusters of dates are almost literally candy on trees. Those rich ripe Khalasas, for instance, are seventy to seventy-six percent sugar. They retail, when you can get them, for two to three dollars a pound. Other varieties in many ways are comparable, but in all of America are only some 4,200 acres



The valuable fruit clusters are covered to keep out birds and rain

of date orchards, and there are reasons why we aren't likely to have many more soon.

As recently as 1930, both the Coachella Valley of California and the Valley of the Sun in Arizona, were trumpeting themselves as western Gardens of Eden because of their potential in dates. The trumpeting has subsided, even though the potential is still there. Date acreage could easily be increased to 200,000 or better because horticultural conditions are ideal. Demand is good because America consumes 75,000,000 pounds of dates a year, in peacetime, even without promotion. But we lack the peasant labor that Arabia has, and dates require amazing hand work. Thus it may be that the Arab princes have the last laugh, after all.

When we stole the priceless Khalasa from them we created a scenario that Hollywood has overlooked. Our Department of Agriculture had imported other varieties through its usual diplomatic channels, but these were poorer grades. To be happy, Americans must have the best of everything, and they knew about the Khalasa. They knew that in Arabia a basket of Khalasa dates

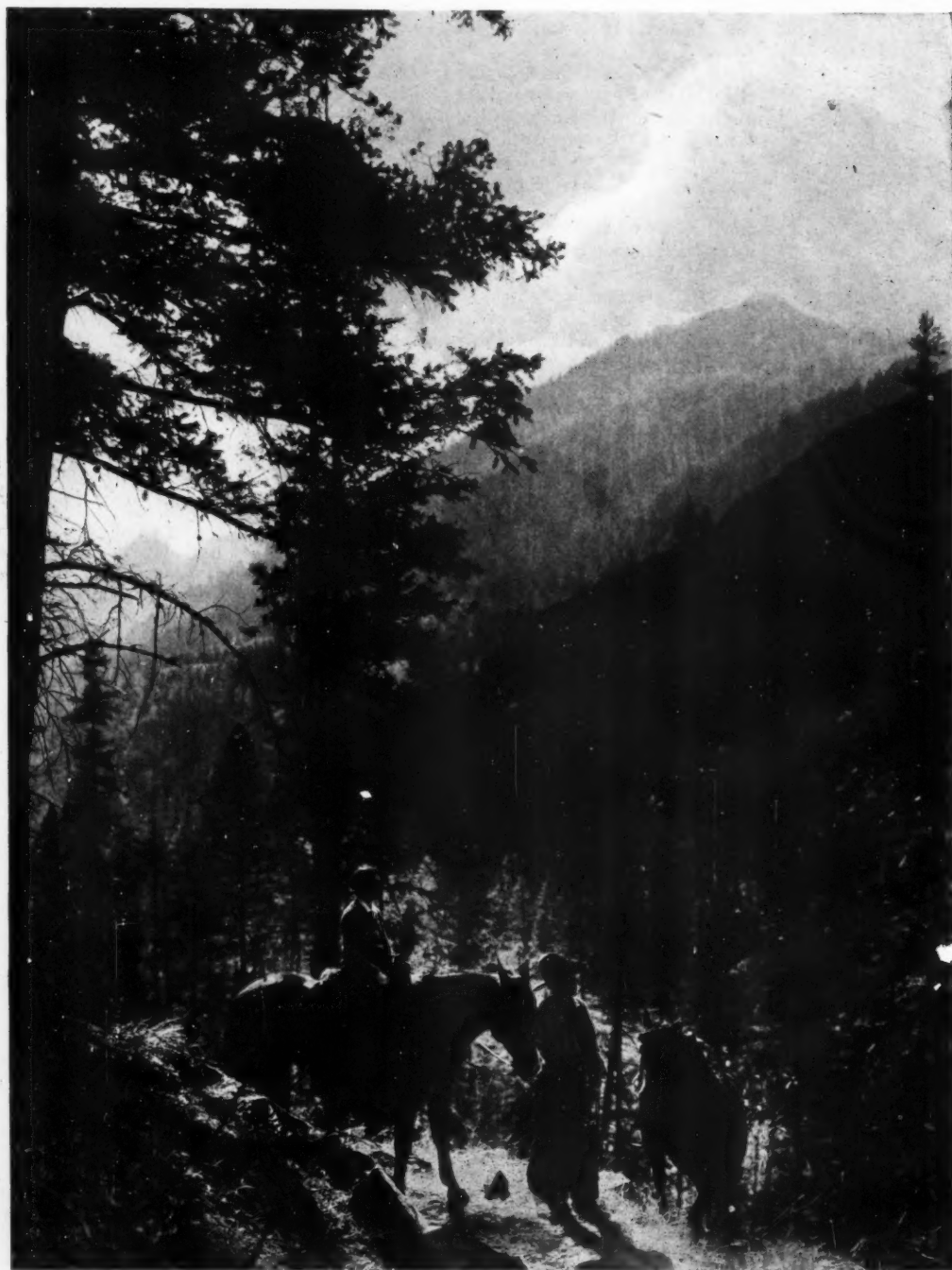
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Half of the fruit is picked green to avoid crowding and increase size



There are 4000 acres of date orchards in America—each acre having a potential average of 10,000 pounds of fruit



DUDE RANCHES WEATHER THE WAR

By GRACE ERNESTINE RAY

If You Can Solve the Travel Problem — It's Still "Boots and Saddle" Out Where the West Begins

UPON leaving Steamboat Springs, Colorado, after winding up a season at Focus Dude Ranch, I was escorted to the station by the constable. But the reason was not what you think. There simply was no taxi service in wartime, so the gallant policeman transported the ladies and their luggage to the station.

This is one example of the ingenuity and hospitality of the West, where a large percentage of the dude ranches have weathered the war and managed to stay patriotic and prosperous without priorities. Despite the manpower shortage and tiresome hours of uncertain travel, Americans still seek necessary holidays in the majestic mountains where they can ride, hike, fish, hunt, or just sunbathe and relax.

Focus is but one of two dozen Colorado ranches that have operated during the war, and Colorado is only one of ten western states where dude ranches have remained open so that tired men and women may dress up in ghastly checked shirts and blue jeans and seek respite from the strain of war jobs. Service men have found dude ranches a boon. Some airmen spend their last leave at a ranch before going overseas. What if some strawberry roan does try

to ground them? They can always make a three-point landing.

More ranches are open now than in 1944. Walter C. Nye of Billings, Montana, secretary of the Dude Ranchers' Association, estimates that ninety percent of the dude ranches operating in normal peacetime years are open this season. Seventy-seven members of his organization are listed as operating. Robert E. Warren, representing the Colorado Dude Ranch Association, lists twenty-seven member-ranches open for 1945.

Dude ranches listed in travel folders indicate there are now 140 of all types, though the term may be used to indicate anything from a fishing camp to a luxurious lodge that has hired help to do everything except ride your horse for you. Secretary Nye points out that the term "dude ranch" is loosely used, that there is a vast difference between a bona fide ranch and the resort type. Guests of bona fide ranches show up every summer, staying at least a fortnight. One man has not missed a summer at Eaton's, oldest American dude ranch, for forty years.

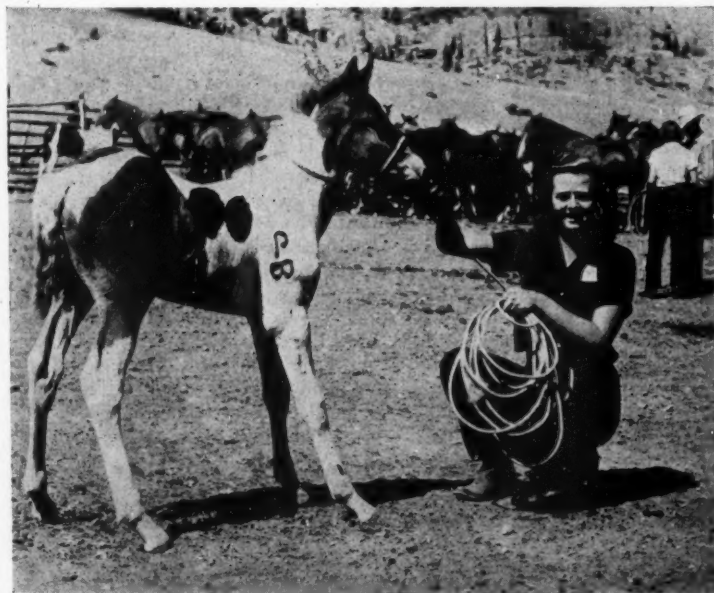
Warren says that accommodations are better at some Colorado ranches

than in 1944, mainly because they have procured services of discharged veterans to ease the manpower situation. Some of these men are convalescents. However, accommodations and service are below those of peacetime.

Returning veterans are finding mountain ranches a cure for jumpy nerves, and for those who want to shoot four-legged animals for a change, game is plentiful. Many dude ranches, of which the Moose Head Ranch at Elk, Wyoming, is an example, guide parties hunting moose and elk in season, as well as deer, bear, teal, mallards, sage hens and blue grouse. Antelope are hunted in two seasons near some Wyoming and Oregon ranches.

Dude ranch rates are slightly higher in some instances than in prewar years. Travel conditions thus far this summer have not been much worse than in 1944, though the situation is expected to tighten up as new restrictions become effective.

In wartime, dude ranches raising cattle have an advantage over the others, for they have popularized the idea of guests helping with roundups and other ranch work. Also, a number of the younger guests stay on as paid em-



Because of the manpower shortage, many ranches have popularized the idea of guests helping with routine work. They saddle and bridle their own mounts, harvest crops, and brand an occasional colt or calf



Ninety percent of the ranches operating in peacetime are open this year, ranging from luxury lodges to "home ranches" taking guests

ployes after their vacation period is over. Some women have demonstrated talent at handling teams in haying season. I'm not talented, but I blundered through with a team pulling a rake on the Focus.

The "home ranches"—just plain livestock farms in scenic setting—have managed well because guests realize that their host and hostess must supervise such things as cattle grazing, milking, chicken picking and ice-cream freezing, leaving visitors pretty much to their own devices.

As I learned at Focus, the carnivorous dude is more contented in the canyons of Colorado than those of New York, where beef has become almost extinct. When easterners start eating those

resurrected prehistoric mastodons that have been preserved in ice a million years, dudes on ranches will be eating fresh beef, lamb and pork. Shorty Temple, Focus proprietor, has 500 head of cattle and a locker which he fills with game in season. He produces chickens, fresh fruits and vegetables, milk, cream, butter, cheese and eggs.

Since the Focus is typical of small operating ranches in wartime, a description of it will give Easterners some idea of what to expect when they go west to live the life of a cowboy. Lodgings were comfortable and quiet—inner-spring mattresses, warm blankets, fireplaces and plumbing. If one were in earnest about the simple life he could have a tent, but all the dudes I saw chose pri-

vate cabins. There were no street cars clanging, no train whistles, ambulance sirens or newshawks. Just the coyotes sending forth plaintive melodies in the distance after dark.

We were fifty-four miles from a railway station. Thus, if you wished to prolong your vacation and plead the excuse that you missed connections, the possibilities were unlimited. Yet Lucy or Shorty can usually slip into town through the mud. Another advantage at Focus was that mail came only three times a week, and the phone lines often got crossed, so that there was no way by which guests could suddenly be summoned back by the boss. Of course if you don't want to get away from the phone, you can find dude ranches with private lines.

Our main diversion was horseback riding, morning, noon and night, but the sedentary individuals could sit under cottonwood trees and gaze at the lofty peaks. At night the moon makes an enchanting white light on the mountains, and the wind in the cottonwoods sings a peaceful song.

In the matter of riding, Shorty said women should realize there's no need for a dude to be an accomplished equestrian. All she needs is a desire to ride and a pair of pants so she can get one leg on each side of a horse. For the timid soul he has horses as listless as thyroid patients, and for ladies with riding cups and ribbons he has spirited steeds that will stand for no foolishness from pieces of paper beside the trail or from tumbleweeds lurking in fence corners. Shorty sees to it that everyone is safe and satisfied. He is far different from the pioneer cowboy who played tricks on Easterners. One cold-blooded cowboy of the eighties is reputed to have said there never was any reason for a good rider to fall off a horse—unless the horse fell. In that case the rider could not be expected to sit up in the air unsupported.

There was never a dull moment during my two war vacations at Focus, but I have also had one recent vacation at a Montana ranch, where the outstanding event was a camping jaunt during which I got a wild west education and earned the equivalent of a Ph.D. in pack trips. Far from highways or cabins, we threw our bedsacks beside a blue glacial lake bordered by symmetrical evergreens with a backdrop of snow-tipped mountains. We took no tents.

"Pack up your bedsack and ride," said Joe Mapes, head wrangler, when we planned the trip. On one high plateau traversed by a narrow, winding stream, we caught trout with our hands by heading them into bends and cornering them under moss-covered banks.

(Turn to page 404)



Pack trips are still available provided the dude is willing to cut wood, pitch tents, clean fish and perform numerous other camp duties. But there is plenty to eat, including steak fries and trout in season



For winter vacationists, year-round dude ranches in the Southwest have growing appeal. Riding in the picturesque foothills is the main attraction, though many are drawn by the lure of sunshine and a mild climate

FOREST MANAGEMENT IN ACTION

The Forty-Year Program of the Collins Pennsylvania Forest

By HAROLD OLSON

ONE of the larger private forest properties in Pennsylvania is now being rejuvenated by systematic forest management. It is the Collins Pennsylvania forest near Tionesta in the Alleghenies.

This property, acquired by T. D. Collins in 1854, was lumbered more or less continuously until his death in 1914. Thereafter it was held and managed by his son, Everell S. Collins, until he passed away in 1940. His will provided for a trust to hold, 'manage,' develop, conserve and operate the property, with the Board of Missions of the Methodist Church to receive seventy-five percent of the net proceeds.

Two years ago a long-range plan was put in motion for bringing this 22,000-acre timberland area into full production on a sustained yield principle. This plan, which looks ahead forty years to

the time when maximum harvests can be expected each year, is now well under way.

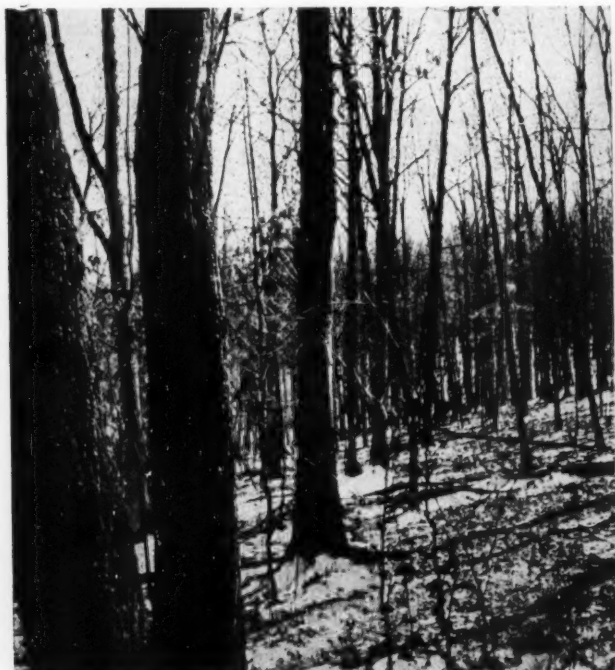
In embarking on the long-pull forest program, many factors were taken into consideration by those entrusted with the management of this tract. This was good timberland, suited more to the growing of trees than to any other purpose. Even without attention, it was growing trees. With attention it would grow more, and of the most desirable species. There would be a long wait for returns — twenty years — but after that there would be a steady income from the property. Not only was this adjudged sound business for the present, but it would lay the foundation for a permanent benefit to future generations, in forest products, jobs and gains.

A "permanent, profitable forest enter-

prise," is the way George C. Flanagan, chief forester for the Collins interests, described the program. The objective was to build up and improve the forest establishment to such an extent that by 1982 it would be possible to harvest each year 5,500,000 board feet of timber without ever depleting the stand.

Foresters know this can be done. They have blueprinted the stand, the potential growth, values. They know that during the first twenty years, 1,000,000 feet of sawtimber can be harvested from the forest annually, and that between 1962 and 1982 it will be possible to cut 4,000,000 feet every year. And all through this forty-year improvement period the forest inventory will be increasing.

In 1942, the Collins Pennsylvania Forest consisted of two fairly well



This stand of red and white oak, twelve to eighteen inches in diameter, escaped the chemical wood cutters



Mature trees on this stand of maple, hemlock and beech were harvested. Another cut will be ready in a decade

blocked stands—the Mayburg unit of 14,185 acres and the Nebraska unit of 7,784 acres. Since then, the Nebraska unit has been enlarged to include about 12,000 acres. Except for about ten percent in clearings or rocky terrain, it is all forest land of good quality. Originally it bore some of the finest timber growth in the United States. The lands were acquired by T. D. Collins in virgin or partially cut condition. The old growth was at first lumbered over a considerable period of years, in a more or less selective way, and as a result a substantial stocking of the smaller, or otherwise less profitable trees, was usually left holding the site and keeping the land at least partially productive.

About 1912 a chemical wood plant was built at Mayburg, right in the heart of one of the timber units, and cutting operations spread out over that unit. The land in some places was left rather bare, but natural restocking of young growth was rapid, the residual small trees grew fast, and areas close to the plant, which were cut first, now bear a heavy stand of trees from six to eighteen inches in diameter.

"God willing, these areas will be ready for a selective sawlog cutting in another fifteen to twenty years," said Flanagan.

Other areas in the Mayburg unit are coming along well, and foresters estimate that a perpetual operation cutting

from 2,000,000 to 4,000,000 feet each year can be maintained in this unit after 1962.

In the Nebraska unit a good part was not cut for chemical wood. This unit now bears a fine growth of young timber, twelve to twenty-four inches in diameter, with enough of the older trees on certain warrants to provide a present cut of about 2,000 feet to the acre.

Since growth of the younger trees would actually improve with removal of the more defective mature stems, it was arranged in 1942 to start this selective improvement cutting. A contract operator moved in with a small mill. His bid on the stumpage averaged \$8.54 a thousand for all species.

This was the beginning of the harvesting plan, to go hand-in-hand with forest improvement. Only certain trees, marked by the foresters, were cut. Diameter limits were set in such a way that over a long stretch of time the more valuable species, such as sugar maple, black cherry and white ash, would get the forest right-of-way. No trees of these species—defectives excluded—were marked for cutting unless they were twenty-two inches or more in diameter. For white pine, white oak, red oak, yellow poplar, cucumber magnolia and shagbark hickory the minimum cutting diameter was set at twenty inches. On red maple, hemlock and beech it was eighteen inches, and on birches, black

gum and other lower grade hardwoods, sixteen inches.

As a result of these limits, more than three-fourths of the cutting was restricted to white pine, white oak, red maple, hemlock and beech, while only a very few trees in the sugar maple, black cherry and white ash category qualified for harvest. They were left to grow—and will grow faster with more room.

The first operation was only a limited contract, terminating in 1944. It is proposed later for the company to build its own mill on a site most convenient to the two units.

"It is extremely encouraging," says Forester Flanagan, "to calculate what can be done with the growth. It can be managed and developed into heavy stands of sound, straight, clear-boled trees, including a high percentage of the most desirable species. Such timber in this locality will always bring a good price and find ready market. Even the relatively poor stand such as the older growth cut during the past two years brings a satisfactory price.

"There appears to be no technical reason which would prevent conversion of this entire tract to a highly productive forest within a period of ten to thirty years, or the maintenance of such a stand thereafter, in perpetuity, through reasonable protection, management and selective cutting."

(Turn to page 405)



Area clearcut for chemical wood twenty-five years ago now supports a young growth of white oak and black cherry



Regrowth of aspen, maple and black cherry on area clearcut and severely burned over about twenty years ago

Ancient Timber Churches

By E. R. YARHAM

of Norway

THE staunchness of the people of Norway during the years of Nazi occupation, and their unshakable faith in their ultimate liberation, commanded great admiration of the free people of the world. That courage is grounded in deep religious conviction.

Yet Christianity did not reach Norway until much later than it did Britain and most parts of Europe. Even then Christianity was thrust upon the people, the enforced conversion of Norway, Iceland and Greenland being the work of Olaf, who had a short but brilliant reign of only five years, falling in battle in

the year 1000 A. D. Both Olaf and his successor and namesake looked for help to England, whence they obtained a bishop and priests. The Church played a prominent part in the early history of Norway.

The most striking evidences of those early and stormy days of Christianity are the ancient "Stav-Kirker," or Stave churches, made of timbers now blackened with age, some grotesquely carved with dragons' heads and other designs reminiscent of pagan days, which are found scattered over southern Norway. At one time it is reckoned there were

300 of them, but the ravages of centuries, neglect and destruction wrought by fire and deliberate demolition have radically reduced that total to hardly a score.

These Stave churches are recognized to be the most remarkable timber buildings in Europe. Their origin is a mystery, and sometimes the presence of a separate bell-tower or belfry, as at Ringeby, Borgund and Hitterdal, hints at Byzantine influence. There is, in any case, a distinct eastern style about the buildings, the majority of which were built during the eleventh and twelfth centuries. They



At Borgund, in the Valley of Laerdal, stands this most ancient of the Stave churches, with its age-old, blackened timbers, pagan dragon heads and separate bell-tower

slain, occasionally human sacrifices were offered. The blood was caught in special bowls of metal or wood and sprinkled on altar and walls and on the gods and worshippers. The early Nor-

except at the east end, though occasionally, as at Hedalen, it was completely closed in. The entrances to this cloister were opposite the doors of the church itself, and were often in the west end, or under one of the many gables of the roof. From the cloister roof there sprang the wall of the south aisle, then came another roof, and then the nave wall, supporting the largest roof, which was crowned by a pointed tower often placed on a sort of cross roof. The chancel was similarly constructed, though the dimensions were smaller, and there was often no tower, while the apse did not generally exceed two stories, and was semicircular in shape, often finished off in a small round tower."

are covered with shingles which have the appearance of scales.

The dragon head terminals to the gables of the churches suggest the prows of the ancient Norse galleys, and unquestionably in the design of the structures lies the direct influence of pagan days. It has been suggested, with a considerable show of truth, that the Stave churches are directly descended from the pagan temple called Hove, or Hov. The Hov was built of stone or wood, and consisted of a nave and chancel. In the center of the former was a flat stone fireplace, and on this was cooked the flesh of the sacrifice. There were wooden seats along the sides and a high seat with carved pillars, where sat the heathen chief who officiated at the rites. An altar stood in the center of the chancel, and behind were wooden images of the Norse gods, Odin, Thor, Niord, and Halder. Usually beasts were

wegian Christians did the same there as was done in many other countries. They transformed the pagan Hov to the Christian church and incorporated in the latter many of its characteristics, particularly the carvings that adorned it. In his *History of Church and State in Norway*, T. B. Wilson speaks of the Stave churches as follows: "The church generally consisted of a nave, a chancel, and a semicircular apse, and was surrounded by a sort of cloister (*svalgang*, or *omgang*), which was generally open



The church witnessed stormy days in early Norway. Something of the ancient heathen influence is carried over in the architecture and beautiful carvings in wood found in the churches—dragon heads and other pagan symbols, which have been subtly changed

The oldest existing building in Norway is the Stav kirke at Urnes. It was built about 1090, and stands on the site of a pagan Hov, some of the material of which can be traced in the present church. The Stave church stands on an eminence about 300 feet above the Luster Fiord, and the view from it is very beautiful. It contains some beautiful carvings, and some experts are of the opinion they show evidence of early Irish craftsmanship.

Some of these venerable churches are now in the care of the Norwegian Society for the Preservation of Ancient (Turn to page 410)

MARYLAND'S HOMESPUN FORESTRY

By HENRY S. KERNAN

SPLIT at one end by Chesapeake Bay, and squeezed against Pennsylvania by the Potomac, its winding southern boundary, the Old Line State's 6,500,000-odd acres of land surface are diversified by the Appalachian Range, the Piedmont Plateau, and the Coastal Plain. The resulting variety is proverbial. Spruce and hemlock in the western hills are matched by cypress and tupelo in Pocomoke Swamp, only a few miles from the Atlantic.

Maryland forestry can thus be studied by recognizing four regions, distinguished to some extent by their forest types, but more by certain factors which have produced conditions peculiar to each.

The part referred to as Western Maryland comprises the four large counties of Frederick, Washington, Allegany and Garrett. The first two contain



This article previews the findings in Maryland of the Forest Resource Appraisal of The American Forestry Association. Rhode Island was presented in September 1944, Michigan in May, Indiana and Colorado in June, and Arkansas in July, 1945.



Western Maryland is a country of tree-covered ridges and cultivated valleys

some excellent rolling farmland, especially in the neighborhood of Hagerstown. To the west, the country is one of steep, parallel ridges rising to slightly over 4,000 feet elevation. Nearly half is covered by a typical Appalachian forest of oak, with a scattering of northern hardwoods and conifers containing an estimated 1,212,000,000 board feet of sawtimber.

Here the mining industry has shaped the pattern of forest ownership and use.

An excessive demand for mine props exposes the land to overcutting

Less than a third is in farm woodlots, while the bulk of the remainder is held in large tracts by mining interests, wood-using industries and railroads. Five state forests cover 88,220 acres.

Utilization is close, due to an eager demand for mine props in addition to the market for ties, pulpwood and logs. On the other hand, coal is plentiful and little fuelwood is cut.

Full-time, native white labor has been the rule in this region. Recently several Nazi prison camps have been located here in an effort to boost slackening production.

As in other parts of Maryland, the fire control system is well-organized and equipped to intensify its services as funds are allotted to it. Five cents an acre could well be spent rather than the present amount of one and one-half to two cents. The greatest needs are for better equipment, more trained personnel, and more publicity.

Although incendiary fires are more common in Western Maryland than in other sections, the real problem is one of human carelessness. Brush-burners, smokers and campers account for at least three-fourths of all fires in the state. A policy of prosecuting all offenders is being vigorously and successfully followed.

On the whole, the four counties of Western Maryland are probably behind the others in good forestry practice. Some land is well-managed; but excessive competition for a dwindling growing stock is the principal fact revealed by The American Forestry Association's appraisal project.

Northern Maryland includes six coun-



ties of gently rolling farmland swinging around the head of Chesapeake Bay. The governing factors as regards forestry are the excellent soils and the City of Baltimore.

As do other great metropolitan areas, Baltimore engenders a zone of speculative suburban development, in which tree growth, although considerable in volume and spread over a large area, cannot be counted upon seriously as a forest asset.

The very high level of agriculture in Northern Maryland has resulted in a prosperous and stable rural population. Generally, the owners take pride in their woodlands and do not allow them to be devastated for a lump sum of cash. Nor do they pasture their high-grade dairy herds in the farm woodlot. Protection, marking and selective cutting are taking root here as nowhere else in the state or perhaps in the country.

Such homespun forestry is no doubt due as much to common sense and pride of ownership as to any conscious effort to follow good management practices. But it is definitely there.

Northern Maryland contains 431,000 acres of forest, less than a third of its area. Over half of this is in farm woodlots. Water companies, parks, estates and federal reserves include so much more that little is left for industrial ownership.

The standing volume of sawtimber is estimated at 522,000,000 board feet. There are practically no softwoods; but the hardwoods are of an unusually high quality, with oak and yellow poplar (tuliptree) predominating. These species supply a steady and accessible market with veneer lumber and pulpwood. Inferior species are beech, gum, hickory and red maple. The war created an unusual demand for these in the form of dunnage; and no doubt many tons of military supplies arrived in Europe stowed in wood from the forests of Northern Maryland.

That part of the state south of Baltimore, between Chesapeake Bay and the Potomac River, is known as Southern Maryland. It is typical of the Coastal Plain, flat to gently rolling, with sandy to sandy-clay soils.

Farming is not as diversified as further north; and the large acreage in tobacco exerts an important influence upon the forest. Tobacco culture is traditionally shifting and destructive. Consequently, most of the timber stands upon abandoned fields. Moreover, as tobacco growing and curing amounts to a year-round activity, woods labor, even in winter, is scarce.

There are in these seven counties over 1,700,000 acres of land; they are about fifty percent forested, with 365,000 acres in farm forest. Estates, lumber and pulp companies hold most of the remaining 493,000 acres.

Magnificent stands of virgin hardwoods are to be seen only a few miles from the city of Washington. An examination of these shows that the original forest must have been predominately white oak and yellow poplar, with an understory of dogwood and holly. In contrast, the present forest cover is gen-

erally disappointing; and one feels that there has been a greater retrogression as regards species here than in any other part of the state. Understocked stands of scrub oak and gum interspersed with scrub pine are all too common.

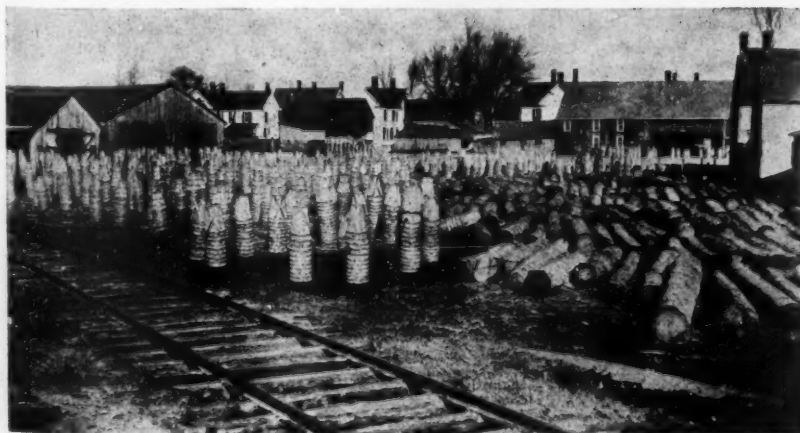
However, growth is rapid and probably equals the rather haphazard exploitation. Pulpwood is shipped out in vast quantities. Portable sawmills are a common sight and account for a cut of some 27,000,000 board feet every year. Untold quantities of fuelwood, poles, and posts are cut and used by the inhabitants, or sold in and around Washington.

For many reasons the Eastern Shore presents the best opportunity for the practice of forestry. For one thing, transportation is unrivalled. The marketing of truck crops, seafood, and poultry require the excellent network of highways and railroads. Moreover, broad, navigable waterways wind into the heart of the region to connect it with Chesapeake Bay and thus give access to coastal markets.

With agriculture intensive and highly developed, land use is fairly stable, with only a slight tendency to revert to for-



Loblolly pine grows fast and dense on Maryland's Eastern Shore



est. Of the 1,500,000 acres, about 743,000 are forested; and of these over forty percent is in farm woodlands.

Another factor is the favorable forest composition. Nowhere does loblolly pine grow better than on the Eastern Shore's southern half. Here its only rival is the sweetgum; and a silvicultural problem of keeping pineland in pine does exist, as in Southern Maryland. But with care an operator can

(Turn to page 408)

The truck-farming industry provides a ready market for forest products

800th FORESTRY COMPANY CITED

THE 800th Forestry Company of Peninsular Base Section in Italy, has harvested enough timber to bridge the Atlantic from Europe to America. During a ten-month period in the mile-high "Hair on Your Chest" Sila Mountains, the company produced more than 60,000,000 board feet of lumber, 7,000 pieces of piling, and 75,000 railroad ties.

Recently the company, commanded by Captain H. C. Eriksson of Woodbury, Connecticut, received a Meritorious Service Unit Plaque and citation "for superior performance of exceptionally difficult tasks and outstanding devotion to duty."

It is one of the many units of the main Army Service Force in the Mediterranean Theater of Operations, the Peninsular Base Section, commanded by Brigadier General Francis H. Oxx, of Newport, Rhode Island.

A citation accompanying the plaque to the 800th Forestry Company reads

in part: "In spite of bitter cold, snowdrifts, mountainous terrain and many other difficulties, this unit established and maintained a rate of lumber production approximately double the peacetime output of the region, which resulted in a saving of thousands of tons of vital shipping space urgently needed for other purposes. In addition to operating its own equipment, this company by diligent hard work and ingenuity, skillfully and efficiently managed approximately sixty Italian sawmills, thus contributing greatly to the operation of the Peninsular Base Section and reflects great credit upon the military forces of the United States."

Activated on June 13, 1942, at the A.P. Hill Military Reservation in Virginia, and receiving specialized training at Camp Claiborne, Louisiana, the 800th Engineer Forestry Company shipped for North Africa on April 29, 1943. While awaiting its sawmill equipment, the

company herded prisoners of war in the Constantine and Oran areas. Later assigned to cut 1,000,000 feet of oak timber for urgent Army needs in North Africa, the forestry unit filled the order so speedily and efficiently that it earned the commendation of the Eastern Base Section's engineer officer.

On December 13, 1943, the company landed on the Italian Peninsula, where the serious shortage of lumber was hampering military operations. After cutting 75,000 board feet of lumber near Montesano, the company set up shop in a 1,000-square mile tract of timberland high in the Sila Mountains, where fifty-four private mills and a state mill were contracted to saw lumber under the supervision of the company. Four hundred civilians are directly employed and an additional 3,000 civilians worked under the company's supervision.

In mid-February 1943, a ten-foot snow
(Turn to page 412)



One of the mills in the Sila Mountains of Italy operated by the 800th Forestry Company, recently awarded the Meritorious Service Unit Plaque and Citation. This company produced enough lumber to bridge the Atlantic



Further Progress in Forest Conservation

Twenty-one years ago this enormous sawmill waste wood burner had to be installed to dispose of those portions of the logs that could not then be converted into saleable products. The burner was 140 feet high and 48 feet in diameter, large enough to hold 1000 cords of wood. For several years this wood burner operated at full capacity.

This year the burner was torn down. Through-out the 21 years of its life, slow but steady and non-spectacular progress was made in finding economic uses for the

wood that formerly was burned as waste. That job is finished. There now is no waste wood from this sawmill. It all goes to beneficial use and better forest conservation is thereby achieved.

In woods and mills this slow but economically sound and continuous progress in forest conservation is bringing ever nearer the day when forest growth will equal and then exceed use.



WEYERHAEUSER

THE "TAR-HEEL" FIRE TRAILER

By JANE TYSON HALL

THE flat, heavily forested terrain of eastern North Carolina poses a difficult problem in forest fire control. Core of the problem is the 1,000,000 acres of peat soil in the area. And surrounding the core are the thick forests that cover approximately seventy percent of the total land area of the counties composing the region. As State Forester W. K. Beichler points out, this region possesses excellent forest products possibilities, but forest fires long have seriously hampered its full development.

The answer to the problem, Beichler says, is the use of mechanized equipment, such as fireline plows, crawler tractors and trailer-truck units. The standard fireline plows and crawler tractors proved suitable enough for fire control work in eastern North Carolina, but standard trailer-truck units were not particularly efficient for the type of terrain where they were most needed.

For one thing, they were too high, making them difficult to load on flat terrain and thereby slowing up the process of getting the equipment to the site of a fire as quickly as possible. Consequently, Beichler and his assistants de-

signed their own trailer and had three of them built by the Black Diamond Trailer Company of Bristol, Tennessee.

The "Tar Heel trailer" as it is called, is only thirty-six inches above the ground, in contrast to the high-bed trailers' forty-eight inches, thus permitting easy and efficient tractor loading on level ground. The maximum width is eight feet, and the length is approximately twenty-four feet. The payload capacity is 20,000 pounds, and there's a level loading deck (wheels covered flush with the deck); a single axle; and rigid construction. Tires are placed in duel arrangement. The trailer also carries clearance lights, a fifth wheel, and two or three "E" lashing rings on each side. Fourteen-foot strong oak ramps are used when loading.

"We have found this unit amply long for the International TD-14 tractor and Mathis fireline plow coupled together," Beichler said.

A development of North Carolina foresters is a strap iron "cage" placed on crawler tractors. Branches and vines in the forests and swamps of eastern Caro-

lina tend to yank a tractor operator right out of the machine; the "cage" is designed to prevent this type of accident.

Unfortunately, the North Carolina Forest Service initiated its mechanization only a year or so before the war came. As a result, the war-induced manpower shortage has intensified the need for mechanized equipment, and simultaneously, the war shortage of materials has largely curtailed the mechanization program for its forest control equipment.

There are seven fire districts in the state, five of which are in the east. Recently, North Carolina's General Assembly approved the creation of two new districts. Although the headquarters have not yet been chosen, Beichler said that one of the two new districts will be in the east. The equipment on hand is presently distributed at district headquarters at Elizabeth City, New Bern, and Lake Waccamaw.

Ultimately, he hopes to have a trailer-truck and two tractor-plow units for every two or three counties.



North Carolina foresters designed this low-slung fire trailer for the flat woodlands along the Atlantic seaboard. The strap iron "cage" on the tractor is also their creation—to protect the driver from low branches

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Around the States . . .

Tillamook Ablaze Again

Oregon's Tillamook country, west of Portland, scene of disastrous forest fires in 1933 and 1939, is ablaze again. At the time of going to press, three fires had already blackened 75,000 acres and were still spreading despite the efforts of 3,000 military and civilian fire fighters along a 100-mile front. The largest was in the rugged Wilson River area where 60,000 acres had been burned; the others were burning along the Salmonberry River and in the vicinity of Glenwood and Gales Creek. All were on land in state, county, or private ownership.

The major part of the fire area is in the same territory burned over in the disastrous Tillamook fire of 1933, which destroyed enough virgin timber to equal the entire 1932 lumber cut of the United States.

Little green timber has been destroyed as yet, although heavy destruction of logs and logging equipment, mostly used in salvage operations, was reported. Millions of young trees, struggling to heal previous fire scars, have been consumed.

Origin of the fires has not been announced, though it was definitely stated that an early report they were started by Japanese fire balloons is untrue. The most likely cause is from the salvage logging operations.

First Swedish Pulp Arrives

The first shipment of chemical grade pulp arrived in this country from Sweden on June 29, according to the U. S. Department of Commerce. Additional shipments of light pulps used in the production of paper are scheduled to arrive during July and August.

While no official estimates of the shipments are available, informed government sources anticipate from 50,000 to 100,000 tons during July, with possibly 200,000 tons before October. The first shipment to arrive in this country involved 2,216 tons, valued at \$210,000.

Syracuse Names Shirley Assistant Dean

Dr. Hardy L. Shirley, director of the Northeastern Forest Experiment Station at Philadelphia, has been appointed assistant dean of the New York State College of Forestry at Syracuse University. Dr. Joseph S. Illick is at present acting dean of the college.

Dr. Shirley, a native of Indiana, received his B.A. degree from Indiana University in 1922, and Ph.D. from Yale in 1928. He has served as an in-

structor in dendrology and mensuration at the Yale School of Forestry; assistant in biochemistry at the Boyce-Thompson Institute, New York, and senior silviculturist at the Lake States Forest Experiment Station.

In 1935, he was sent to Europe by the Forest Service, to study forest tree seed testing and seed certification; and in 1937 to Puerto Rico, Virgin Islands and Trinidad to study the need for forest research in tropical America, and to outline a program for such work.

Wyoming Drops Jackson Hole Court Case

Failure of the State of Wyoming to appeal the court decision denying an injunction to restrain the National Park Service from assuming administration and jurisdiction of the Jackson Hole National Monument, indicates, it is believed, that the state will take no further action. The decision was handed down by the United States Court for the District of Wyoming early in February, and the time for appeal elapsed in June.

The court also was asked by the state to interpret the Antiquities Act of 1906, and rule on the validity of the presidential proclamation under which the monument was created.

The court's decision admitted that "undoubtedly great hardship and a substantial amount of injustice will be done to the state and her citizens if the Executive Department carries out its threatened program." However, it concluded that, "this seems to be a controversy between the Legislative and Executive Branches of the government in which,

under the evidence presented, the court cannot interfere."

The issue now rests with Congress. The Barrett Bill to abolish the Jackson Hole National Monument (H.R. 2109), introduced into the House on February 12, has not been reported out by the Committee on Public Lands and Surveys. The Peterson Bill, designed to safeguard the rights of the state and landowners in the area, is likewise still in committee.

Schoen Heads Forest Farmers

Paul W. Schoen, since 1944 chief of the Division of Forest Management of the Texas Forest Service, has been named executive secretary of the Forest Farmers' Association Cooperative, at Valdosta, Georgia. He succeeds Wayne G. Miller, who died early this year.

A native of Pennsylvania, Mr. Schoen is a graduate of the Pennsylvania State Forest School. Before becoming associated with the Texas Forest Service, he was forester for the New York World's Fair, directing the selection and planting of trees on the fair grounds.

Forestry Training for Farm Youth

A new forestry educational project for farm youth, financed by the pulp and paper industry of the South, has been announced by H. J. Malsberger, forester of the Southern Pulpwood Conservation Association.

Forestry training camps will be arranged by member mills of the association as fast as plans can be completed in cooperation with the state extension services, forestry departments, vocational agricultural divisions and other agencies active in educational and demonstrational programs. The first camp will be held in Georgia this summer at the Laura S. Walker State Park near Waycross. For one week fifty outstanding and selected 4-H Club boys will be trained how to manage their timber crop on the farm to the best advantage for continuous income. Through the training of 1000 different farm boys each year, the association believes that the program will have a beneficial effect in improving forest practices to the betterment of the timberland owner as well as all the wood-using industries.

Erratum

In "My Favorite Tree," by John Kieran, in the July issue (page 315), the word "white" was inadvertently inserted describing *Betula lenta*, or black birch. In deference to the noted expert, the error was ours and not Mr. Kieran's.—

EDITOR.

CREDIT FOR PHOTOGRAPHS.

Credit for photographs appearing in this issue is acknowledged as follows:

American Forest Products Industries — pages 390 and 391.

Arnold, Oren P., pages 384 and 385.

Besley, F. W., pages 394 and 395.

Hochbaum, H. Albert — drawing on pages 376 and 377.

Justice, Department of—page 373.

Muench, Josef—page 374.

Norwegian Official Photos—pages 392 and 393.

Parkhill Lazy B Ranch—page 387.

Peninsular Base Section Headquarters—page 396.

Sahuaro Lake Ranch—page 389 (lower).

Sovfotos—pages 378 and 379.

Triangle M. Ranch—page 386.

Union Pacific Railroad Photos—pages 388 and 389 (upper).

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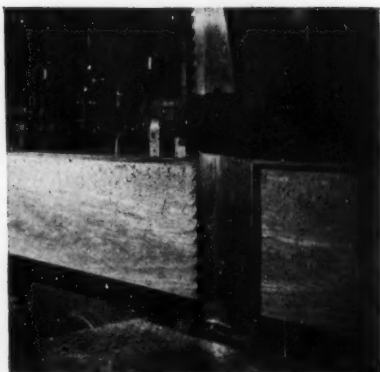
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CONSERVATION IN CONGRESS

CONSERVATION items in the Department of Interior's Appropriations Bill, signed by the president on July 3, total approximately \$14,130,000. While maintaining substantially the same levels as last year, several changes of interest were made.

Chief among these is the authority granted the General Land Office and the Bureau of Indian Affairs to use funds for carrying out the all-important Sustained-Yield Law passed by the 78th Congress (Act of March 29, 1944). This means that for the first time the General Land Office can promote forest management both on the 25,000,000 acres of forested public domain in continental United States, and also in Alaska. Likewise, provision is made for the timber on Indian lands to become integrated into cooperative units.

Several administrative changes were made in fire-fighting items. Funds formerly allotted to the Forest Service for handling fires on the public domain are now assigned directly to the General Land Office. The Grazing Service received an extra \$50,000 for fire-fighting, in addition to the regular amount for prevention and presuppression. Fire protection was made a recognized function of the Fish and Wildlife Service on its reservations.

Major conservation appropriations are as follows:

The General Land Office received approximately \$740,000, of which \$297,000 is for fire protection and timber management, \$310,000 for the O & C lands, \$46,000 for range improvements, and \$87,000 for soil and moisture conservation work.

The Grazing Service received \$1,785,000, of which \$979,000 goes for general administration, \$7,500 for leasing lands, \$106,000 for range improvements, \$185,000 for fire control, and \$507,000 for soil and moisture conservation.

The Bureau of Indian Affairs received \$1,146,000. The administration of forests and range will take \$566,000, timber sales expenses \$138,000, fire fighting \$37,000, and soil and moisture conservation \$405,000.

The Fish and Wildlife Service's appropriation of \$6,219,000 includes \$181,500 for biological research, \$875,000 for predatory control, \$355,000 for migratory waterfowl, \$625,000 for the administration and protection of reservations, and \$1,000,000 for federal aid in wildlife restoration.

A breakdown of the Park Service's \$4,405,000 shows \$1,926,000 for the national parks, \$130,000 for emergency reconstruction and fire fighting, and \$213,000 for forest protection and fire prevention.

The Office of Fishing Coordination received \$212,500.

CONSERVATION CALENDAR

Important Bills in Congress With Action
June 25 - July 16, 1945

Bills Enacted

H. R. 3024—JOHNSON—A bill making appropriations for the Department of the Interior for the fiscal year ending June 30, 1946, and for other purposes. Passed by the House, June 28. Passed by the Senate, June 29. Signed by the President, July 3. Public Law No. 123.

National Forests

S. 1226—HATCH—To readjust the exterior boundaries of the Kaibab National Forest, the Grand Canyon Game Preserve, and Arizona Grazing District No. 1, State of Arizona, and for other purposes. Introduced and referred to the Committee on Public Lands and Sur-

veys, July 3.

H. R. 3777—GILLESPIE—A bill for the purchase of certain lands within the boundaries of the Pike National Forest. To the Committee on Agriculture, July 12.

Miscellaneous

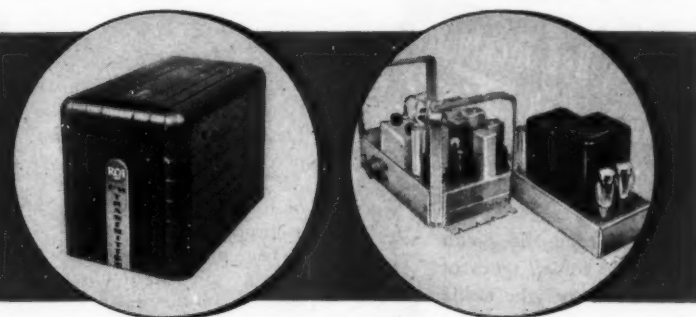
S. Res. 135—BUTLER—A resolution authorizing the Committee on Agriculture and Forestry to make an investigation of the existing newsprint shortage. Reported from Committee on Agriculture, July 3. (Report No. 451.) Referred to the Committee to audit and control the contingent expenses of the Senate.

New RCA 26-42 MC (Mobile or Station) FM Transmitter Features

1. Superior audio quality sets new standard. Sounds better. Easier on the ear. Easier to get message.
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4. Improved phase modulator requires no tuning. No more bother with modulator.
5. Excellent stability over wide temperature range. Temperature change has minimum effect on operation of equipment.
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7. All tuning adjustments are from top of transmitter. Easily accessible. (Remember those times you have had to turn the chassis over?)
8. No high voltage exposed above chassis. All dangerous voltage out of reach. (Many times a slip of the hand might have given you a shock.)
9. Provision for two-frequency operation. Useful when you want to switch over from talking between car and car (and in lots of other ways).
10. Single control cable—also accommodates receiver. One cable, instead of three or four, running from front of car to rear. Simplifies installation and maintenance.
11. Mobile cables equipped with separable connectors. Add flexibility in operating equipment. Equipment removable without using special tools. All cables plug in and lock.
12. Chassis readily detached from base. Easier to inspect and service.
13. Single-unit construction saves space.
14. Easy to install. Mounting hardware supplied. Comes complete, down to bolts and nuts.
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New FM 26-42 MC (Mobile or Station) FM Receiver Features

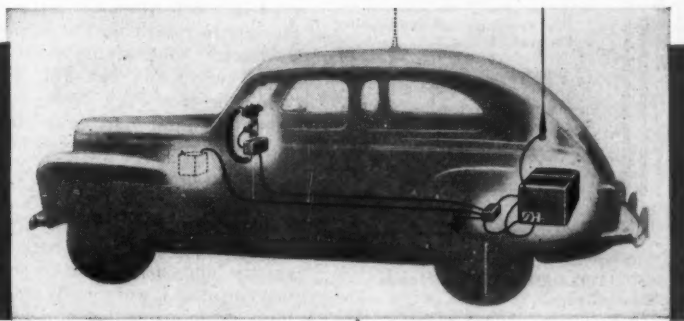
1. Superior adjacent-channel selectivity. You hear the station you want to hear.
2. Low spurious response. Won't pick up unwanted signals.
3. Excellent stability over wide temperature range. Variations in temperature have minimum effect on operation.
4. Single-unit construction. Fewer interconnecting cables. Easier to service.
5. Easy to install. Mounting hardware supplied. Comes complete, down to last nut and bolt.
6. Chassis readily detachable from base. Easy to remove for inspection and servicing.
7. Mobile cables fitted with separable connectors. Cables plug in and lock. Require no special tools. (Another important point—you can't plug in the wrong cable!)
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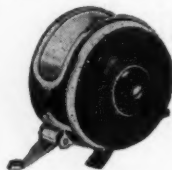


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Buy and Keep More War Bonds

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A Name Famous in Fishing

Russia's Forests

(From page 378)

timberlands fall in Asia, where they occupy thirty percent of the land area. Less than 500,000,000 acres, or thirty percent of the land area, are in Europe. All but a small percentage of the forests of both Europe and Asia are classified as productive.

The northern forests in European Russia are predominantly pine and spruce. In the western provinces there are mixed coniferous and hardwood forests, while hardwoods dominate the prairie regions.

Not too much is known about Siberian forests, still largely unexplored. It is estimated, however, that they will run two-thirds to pine, spruce, fir and larch, and one-third to birch, aspen and poplar. In Turkestan birch and other hardwoods are dominant.

Seventy percent of the forests of European Russia are owned by the state, and in Siberia ninety-five percent.

In a word, Russia possesses not only the largest forest area of the world, but also the most valuable.

Dude Ranches Weather the War

(From page 388)

Wading was cold at that altitude, but we weren't dependent on that type of fishing. In roaring creeks we caught all the fish we could eat, big ones, too. The main difference in fishing at ordinary resorts and on dude pack trips is that you catch fish on pack trips.

The pack trip sans sissy tents sounds wonderful, and it is until it rains. Even then all is well if you drop everything and crawl into your waterproof sack, or don a long black slicker treated with linseed oil.

Bedsacks served as traveling bags and boudoirs, but we didn't take off blue jeans at night—they are so tight they don't wrinkle when you sleep in them. The only problem was finding your own bedsack among the rows of identical sizes and styles on a dark night. Joe had said before we left the ranch, "Now be sure to remember the number of your bedsack." One of the slow-witted girls asked why, and he said, "Because it won't be like Park Avenue up on the mountain after dark with lighted numbers over the door of each home."

I'm no mental athlete, but I managed to remember that mine was No. 54 and that I had put it near the fire. Some of the ashes blew into my hair, but I slept snugly and no raindrops found their way inside. I woke only once—when a large dude swore because he could not turn over inside his sack. It always turned with him.

While not on pack trips or cattle roundups we had archery golf, skeet shooting, horseshoes, softball, tennis, bridge, pingpong, or Michigan poker. For those who could not enjoy the mountains otherwise, there was mountain climbing. There were no Swiss guides, but there were wranglers capable of running the legs off anybody who wished to imitate a mountain goat. And there was swimming. We could go jump in the lake, or if refinement was desired, swim in the heated pool. If frolic was indicated we rode to the river, un-

saddled our broncs, shoed them into the water, caught hold their tails and did some surf riding.

Between steak fries, one of the most essential entertainments, horseback novelty races were popular. Did you know there are twenty-five games to be played on horseback? Perhaps this statistic leaves you cold, because you don't play that way, but many dudes do. Games include the bedroll race, tree tag, treasure hunts, musical chair, and the potato, umbrella, egg, needle-and-thread and handkerchief races and tug-of-war.

Camp work is disguised as fun. This includes wood cutting, fire building, tent pitching, horseshoeing and fish cleaning. And all ages enjoy sitting around the campfire while someone plays a guitar or an old-time cowboy relates experiences.

About the only thing the wartime ranch lacks is automobile trips, but this is an advantage, for a horse has no windshield and top to cut off the view. In case you can't ride, there's an assortment of horse-drawn vehicles abroad that have crawled out since the war like angle worms during a rain. There are stage coaches, prairie schooners, broughams, runabouts, as well as the victoria, tally-ho and surrey with a fringe on top. The chuck wagons are with us, and if you want to travel in a neat little housekeeping unit, borrow a sheep wagon.

The way people endure travel hardship to reach dude ranches in wartime reminds one of the poor salmon that leap all sorts of barriers to go back up the Columbia River to where they were born. I suppose we simply must go back to Nature. Then, too, perhaps the immensity of mountains and deserts charms us—the wide open spaces of New Mexico and Arizona, for example. If you care for figures, New Mexico and Arizona together are five times as large as New York, yet these western states have only a few cities with more than 2,500 population. Mount San Jacinto

towers a sheer 10,500 feet above Palm Springs, California; and Going-to-the-Sun Mountain rises a mile out of St. Mark Lake in Montana. The big Empire State Building in New York is only 1,200 feet high.

If you like big things, go to the Montana-Wyoming ranch country. It has glaciers fifteen miles long, ice skating rinks in huge caves, and the largest uninhabited wilderness areas in the United States. Nevada boasts of Boulder Dam, northwestern wranglers will show you Grand Coulee, Arizona will exhibit Grand Canyon with a dude ranch at the bottom, and Colorado has Grand Lake with a dude ranch beside it. New Mexico has Carlsbad Caverns, and Oklahoma has big new Lake Texoma and Crater-ville dude ranch near the Wichita Mountains Wild Life Refuge, which harbors herds of plains bison.

Your dude holiday could hold adventure, too. You could visit Death Canyon near Jackson Hole, Wyoming, then go to Hell's Canyon in Oregon. In this zombie status the Lightning Ranch at Hereford, Arizona, will pack you into sleepy old Mexico, unless you prefer to settle down in Tombstone, Arizona.

If you want addresses of ranches, just write any travel bureau or railroad headquarters. Or you can address Walter C. Nye, Dude Ranchers' Association, Billings, Montana.

Forest Management

(From page 391)

In order to enable the foresters to map out an intelligent management program, a timber inventory was taken on the entire forest property. This revealed many interesting things. For instance, in the Nebraska unit only twenty-eight and a half percent of the board foot volume of the younger trees—six to ten inches in diameter—was softwood; thirty-eight and a half percent in the twelve to sixteen-inch bracket was softwood, while in the eighteen-inch-plus class the softwood—hemlock and white pine—moved up to forty-seven percent.

All over the unit there was a promising reproduction of choice hardwoods—sugar maple, black cherry and white ash. Only six-tenths of one percent of the total hardwood volume in the eighteen-inch class was black cherry, as against three and a half percent in the twelve to sixteen-inch category, and twelve percent in the six to ten-inch. This indicated that the forest lends itself to selective cutting that will eventually make the more desirable species dominant, thereby greatly enhancing the value of the stand.

Negligible quantities of black gum,
(Turn to page 407)

CARRY THE FIGHT TO THE FIRE!



XF

PORTABLE Centrifugal Fire Pumps

These American-Marsh portable centrifugal pumps are the answer to the fire menace in National and State forest preserves! Type XF can be carried by one man . . . throws 10 GPM against 120 pounds pressure and up to 50 GPM at lower pressures. Type MXF is designed for light trailer or truck mounting . . . throws 25 GPM at 335 pounds pressure and as much as 200 GPM at lower pressures. Type X, as an auxiliary unit for use with motorized fire apparatus, will deliver 250 GPM to a booster tank 35 feet above the pump.

All three pumps are equipped with our automatic exhaust type primer. The pump is automatically primed in 15 to 20 seconds on a lift as high as 20 feet! Engine exhaust prevents freezing, and the design is such that it is not necessary to fill the pump with water before priming. Each of the pumps are operated by an efficient, four-cycle air-cooled gasoline engine which insures easy starting. Being of the centrifugal type, these units will handle dirty water from streams or lakes without excessive wear.

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BATTLE CREEK, MICHIGAN

TALK ABOUT WILDLIFE, by Ross O. Stevens. Published by Bynum Printing Company, Raleigh, N. C. 229 pages, illustrated. Price regular edition \$3.50, student's edition \$2.25.

With inspiring sincerity of purpose the author, professor of zoology at the North Carolina State University, has presented a work which will appeal greatly to wildlife enthusiasts. Reflecting long experience and thorough knowledge the author outlines the major problems encountered by technical workers in game and fish agencies and offers much that should eliminate many of the weaknesses in our present wildlife conservation system. Written in a simple, convincing style this little volume contains a complete and practical course on the subject of game and could profitably be used as a handbook for American sportsmen.

PLANT FAMILIES — HOW TO KNOW THEM, by H. E. Jaques. Published by Professor H. E. Jaques, Mt. Pleasant, Iowa. 174 pages. Price spiral \$1.50; cloth \$2.50.

Simplifying the tremendous task of learning to recognize plants, this is a concise collection of botanical information that is easily read and highly informative. Facts are not based on new research but are merely accumulated data on the important phases of plants, intended to make them more understandable to the student or to the plant-lover appreciating clarity.

SLASH BURNING IN WESTERN OREGON, by J. J. Russell and W. F. McCulloch, Assistant State Foresters. Bulletin No. 10.

Objective and technically sound discussion of slash disposal from two opposed viewpoints, with emphasis on purposes, methods, effects and costs. An appendix contains pertinent Oregon statute. Available from Oregon State Board of Forestry, Salem, Oregon.

ON THE TRAIL TO SANTA FE, by Hallie Hall Violette and Ada Claire Darby. Published by Houghton Mifflin Company, Boston, Massachusetts. 266 pages, illustrated. Price \$1.40.

Fiction, especially suitable for boys who like Western adventure tales. Authentic as to background, based on diaries of traders who passed over the Santa Fe Trail, it relates the adventures of Jonathan, a Missouri lad, whose experiences recall the pioneer days of our ancestors. Indians, Buffalo, dust storms, prairie fires, all peril Jonathan's safety throughout the pages but courage, resourcefulness and luck bring to a happy ending the story of the little pioneer of the Old West.

BOOKS and



OTHER PUBLICATIONS

A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

A GUIDE TO BIRD WATCHING, by Joseph J. Hickey. Published by Oxford University Press, New York, N. Y. 262 pages, illustrated. Price \$3.50.

Describing a bird as, "a shy treasure, which, unlike a stamp, cannot be viewed at will" the author succeeds in intriguing novices and stimulating experienced naturalists in the art of bird watching. The book contains many revelatory facts about the characteristics of both rare and common birds, supplemented by a compendium of valuable information not commonly found in bird books. It is particularly adapted to the amateur, outlining many fascinating methods by which bird life can be explored by the simplest of methods. It is difficult to imagine a reader laying it aside after reading, without experiencing a strong desire to take up the captivating hobby of exploring the mysteries of bird life.

VEGETABLE GARDENING IN COLOR, by Daniel J. Foley. Published by the MacMillan Company, New York, N. Y. 255 pages, illustrated, index. Price \$2.50.

A colorful parade of vegetables, herbs and berries that proves that gardens can be made to delight the eye in addition to nourishing the body. Many of the colored illustrations are exceptional still-life studies—even though the subject is a prosaic bunch of white icicle radishes or a purple-top rutabaga. There are comprehensive sections on the preparation of soil, seed sowing, tools, insects and other related subjects. It will be useful during the entire period between the time the seeds are ordered until the last crop is harvested.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

Drought in the United States Analyzed by Means of the Theory of Probability, by George Blumenstock, Jr. Technical Bull. No. 819, U.S.D.A. Supt. of Docs., Washington, D. C. Price 15 cents.

Report on an Investigation of Water Losses in Streams Flowing East Out of the Black Hills, South Dakota, by Carl B. Brown. Special Report No. 8, Soil Cons. Serv., U.S.D.A., Wash., D.C.

Wartime Lumber Production in the Appalachian Hardwood Region, by Arthur S. Todd, Jr. For. Surv. Release No. 16, Forest Service, U.S.D.A., Appalachian For. Expt. Sta., Asheville, N. C.

Volume Tables for Commercial Timber in the Anthracite Region of Pennsylvania, by Clement Mesavage. A Progress Report—Anthracite Survey Paper No. 4. Forest Serv., U.S.D.A. Allegheny For. Expt. Sta., Bankers Security Bldg., Philadelphia, Pa.

Rates of Sediment Production in Southwestern United States, by Carl B. Brown. Soil Cons. Serv., U.S.D.A., Washington 25, D. C.

Federal Agencies—A Descriptive Tabulation of 428 Functional Units of the Federal Government. Citizens' National Committee, Inc., 1409 L Street, N. W., Washington 5, D. C.

Investigations in Erosion Control and the Reclamation of Eroded Land at the Palouse Conservation Experiment Station, Pullman, Wash., 1931-42, by Glenn M. Horner, A. G. McCall and F. G. Bell. Tech. Bull. No. 860, and

Financial Aspects of Selective Cutting in the Management of Second-Growth Pine-Hardwood Forests West of the Mississippi River, by R. R. Reynolds, W. E. Bond and Burt P. Kirkland. Tech. Bull. No. 861 of the U. S. Dept. Agr. Supt. of Docs., Wash., D. C., price 20 cents each.

Volume Tables for Connecticut Hardwoods, by Walter H. Meyer and Raymond Kienholz. Bull. No. 54, Yale University School of Forestry, New Haven, Conn. Price 50 cents.

The Ganaraska Watershed, by A. H. Richardson. Published jointly by the Dominion and Ontario Governments. Department of Lands and Forests, Ontario, Canada.

Pattern Material for a Forest Fire Prevention Campaign. The American Forest Products Industries, 1319 18th Street, N. W., Wash. 6, D. C.

Saw Timber Volume Estimates for Oregon and Washington, compiled by the Forest Survey. Pac. N.W. For. Expt. Sta., Portland, Ore.

Forest Management

(From page 405)

butternut, elm, hickory and sycamore were found.

On the Mayburg unit the story was much the same, with softwood reproduction having hard sledding after the hardwoods got under way. Of the larger trees, sixty-two per cent by net volume was in softwoods (hemlock 52 percent). In the intermediate group—twelve to eighteen inches—this ratio dropped to thirty-seven and a half percent, while in the younger class it dropped to fifteen percent. Meantime most of the hardwoods, including the best ones, expanded their holdings. The most prolific was black cherry, also one of the most valuable. The unit had no black cherry over eighteen inches, but in the intermediate class it was found that seventeen percent of the hardwood volume was in this species. The percentage rose to nineteen in the six to ten-inch group. White ash, sugar maple, white and red oak also pointed to strong restocking capacity in heavy competition.

In other words, it was found that the smaller trees include a better percentage of the more desirable species, and as the marking plan removes a heavier percentage of the less valuable individual trees the stand should gradually improve and each succeeding cut should be of better quality than the last.

While the cruise showed a substantial net volume in trees eighteen inches and over, the bulk of this merchantable timber was found to be so scattered as to be economically unworkable at this time. Two thousand feet an acre was deemed the minimum for an economical cut, and so, tracts offering less than that were left to put on growth.

Information assembled by the foresters indicates a present average annual volume growth of 175 feet an acre, which they believe can be stepped up to 200 feet and more within a decade under proper management. Increment borings and ring count measurements on the stumps indicate that most of the dominant trees in this area, of all sizes, can be expected to grow about five inches in diameter in twenty years. Some will do better.

The reconnaissance gave the foresters detailed information as to the timber on every warrant in both the Nebraska and Mayburg units. From it, and from figures on prospective growth, they worked out a schedule of cutting for the entire first forty years of the enterprise. This schedule not only fits in with forest improvements but also provides an orderly marketing program for the timber. Its stand being farther along toward commercial maturity, the Nebraska unit was first to be started on selective logging in

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You may not be a manufacturer of aircraft, but your cutting problems, like his, may include the use of band saws. Then you will be interested in—

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Blades are hardened on tooth edge only, and are designed for low speed operation in the cutting of steel, cast iron, and the tougher alloys. Teeth are not punched, but milled and then accurately set by machine. Noted for their ability to hold their sharpness longer and stand up well in service.

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TO provide a basis for informed postwar handling of one of the country's most important natural resources, The American Forestry Association is undertaking a fact-finding survey to determine what effect the war is having upon the country's forests and forest lands and what will be their condition when the manifold problems of reconstruction are at hand. This important undertaking is known as the Forest Resource Appraisal.

Public-spirited citizens, industrialists and organizations alert to the need of forest conservation and development in postwar economy are making this survey possible by underwriting its estimated cost of \$250,000.

Many other individuals and organizations are indirectly supporting this activity through membership in The American Forestry Association. We would welcome your participation in the important program of the Association, and for your convenience the various classes of membership are listed in the coupon below.

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8-45

1943. Initial cutting was in two warrants only. After the marked trees in these warrants are harvested, the other warrants will be worked in order of maturity, thus putting the entire unit in operation on a rotational, perpetual basis.

The indicated yield on the Nebraska unit is about 1,000,000 feet annually for the first twenty years and 2,000,000 feet of mature sawtimber every year thereafter.

Since the Mayburg unit needs more time to bring its crop to maturity, cutting there will not start until 1962. Beginning that year, the unit for the first ten years will produce more than 2,000,000 feet annually. As additional warrants come into the picture for a first cutting and as other warrants get ready for their second cutting, the Mayburg unit production should gradually increase to 3,500,000 feet a year by 1982. And that figure means a perpetual yield of that much timber every year. Such is the magic of modern, scientific forest management.

For future years when cropping is fully established, the foresters propose to vary the cutting limits somewhat, to increase growth and ultimate yield of the better species. They suggest the following limits:

Hard maple and black cherry, twenty-four inches; white pine, white ash and oak, twenty-two inches; yellow poplar (tuliptree), cucumber magnolia and basswood, twenty inches; birches, beech, red maple, hemlock and other hardwoods, eighteen inches.

It may be found advisable to remove certain smaller trees during the first cutting in order to improve growth of the stand. These, whether merchantable or culls, will be marked for cutting along with the mature timber. Those culled and left by the logger will be sold to woodcutters and removed with the tops for pulp or chemical wood in the cleanup which follows the main logging

operation.

It is planned to keep a forester trained in marking, scaling, utilization standards, stand improvement and fire prevention, on the ground working with the resident manager. Later he may need assistants, but the overall management plan proposes that the cost of administration shall never exceed twenty-five percent of the receipts.

Fire prevention naturally enters emphatically into the long-range plan. A disastrous fire could raise havoc with the program. So the forestry staff must see to it that any fire is promptly suppressed. State wardens and the United States Forest Service do most of the fire suppression work in Pennsylvania, but the Collins foresters are instructed to take prompt action of their own whenever the fire strikes on or near the property. The fire season occurs usually in the spring, and again for a short period in the fall.

Chief Forester Flanagan, in summing up his management plan, drew the following picture:

The estimated net liquidation value of the Collins Pennsylvania forest properties (timber and land, 1942) was less than \$100,000.

Under planned management the gross income for the first twenty years would just about cover taxes, administrative expense and possible three percent interest on capital tied up in land and growing timber.

After 1962 a continuous gross income of \$40,000 a year can be expected. Administrative costs and taxes should run about \$16,000 a year.

These are the practical aspects that go to make the forest management plan good business. There are other considerations, of course,—the beauty of a fine forest, its value in erosion control, and above all the knowledge of a good job done in perpetuating and improving a great natural resource for generations to come.

Maryland's Homespun Forestry

(From page 395)

make sure that cutover land will "set" to pine and yield more logs and piling.

Such care is largely a question of cutting the low-grade hardwoods along with the pine. Fortunately, there is at all seasons a ready market for boxes, crates, barrels and baskets made locally from hardwood for the fishing and truck-farming industries. A special use of hickory is for "pound" poles. Driven into the sandy ocean floor, they hold the fishing nets and stand the ocean swell better than other species.

Lacking coal, each farmer cuts his own fuel in his woodlot. Some, especially tenants, take the nearest tree; but at

least a few cull the poorer trees with the conscious purpose of holding the better for sale. Another use of the woodlot is as a source of pine needles, or "slats," to litter the chicken houses.

The absence of native fodder grasses insures that the woodland will not be grazed.

Before the outbreak of the war, logging was done mostly during the off-season in winter. Under pressure for production, loggers have attempted to carry on the year round, and have had to meet competition for labor from the farms and canneries. Generally, they have not been successful, and output has

consequently fallen off, due to lack of manpower.

However, seasonal logging is probably better adapted to the economy of the region and will return after the war. In that case, the tendency toward large, full-time mills noticeable since the war will disappear, and the traditional small, part-time unit will be set up.

This intensified demand for forest products was felt throughout the state as



The State marking service brings to the landowner tangible and practical forestry

well as on the Eastern Shore. Everywhere, however, the first upswing of production has been followed by a general slackening due to manpower problems. The approximate cut of 125,000,000 board feet in 1943 was reduced to 110,000,000 board feet in the state in 1944. Whether the woods as a whole will suffer or prosper under this increased appreciation of their value is a fascinating question.

An encouraging note brought out by the Forest Resource Appraisal study is that the amount of standing sawtimber is larger than was imagined. Tentative figures, subject to check and revision, show that 4,420,000,000 board feet stand upon the state's 1,900,000 acres of forest twenty years old or more, with an average of 2,300 board feet an acre.

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MALL Gasoline Engine Chain Saw. Available in many cutting capacities. Also Pneumatic and Electric models.

MORE TIMBER—Cuts trees closer to the ground, leaves shorter stumps, adds lumber to every tree. Also lessens fire hazard.

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In the field, of forest legislation, Maryland has long been a pioneer. The State Board of Forestry, established in 1906, was the earliest and has been among the most successful of state forestry agencies. At first it concentrated upon fire control and inventory of forest resources; but with the passage, in 1943, of the Forest Conservancy District Law, it moved into the sphere of regulating cutting on private woodlands.

The novel and essential feature of this act is that forest districts are set up under local boards which work with the state forester in formulating and promulgating rules of forest practice which have the force of law. Provision is made for seed-trees, selective and clear-cutting, for fire protection, for wildlife, and for the preservation of the native holly. Logging operations are licensed and inspected by state foresters. Admittedly the rules are kept at a minimum.

Thus far the law is obviously in an experimental stage. The stated policy has been to enforce it through goodwill and education rather than through wholesale prosecution. In fact the dis-

trict boards, of which three have been set up, function principally to ensure local cooperation.

It is, of course, too early to judge the law as a whole. Some complain that it is not well enough enforced and some that it is too inflexible. Others say that it would be hard to find a logging operation that does not qualify without any particular effort on the part of the operator. But on the whole, response from the public has been encouraging.

The state marking service is another outstanding feature of Maryland's public forestry. A landowner wishing to sell timber may call upon the district forester for a preliminary survey. If he decides to sell, up to thirty acres may be marked free of charge. This service has been a powerful force in bringing before landowners tangible and practical forestry.

That is, after all, the central problem in Maryland; and the one toward which progress will be made under the leadership of State Forester Joseph F. Kaylor, whose imagination, energy, and boldness insure that Maryland will continue a successful pioneer in forestry.

Ancient Timber Churches of Norway

(From page 393)

Buildings. Just over a century back, in 1841, the Stave church at Vang was sold to the then King of Prussia, who had it taken to Silesia. This would not be permitted today, and it is pleasing to learn that the splendid Folk Museum close to Oslo has a fine example of a Stave church, which was originally built at Gol, in the Hallingdal, about 800 years ago. It has the dragons' head gable terminals and shingle roof characteristic of the buildings.

The beautiful old Stave church at Borgund, picturesquely situated in the grandest portion of the ravine-like valley of Laerdal, is perhaps the best preserved of the buildings. It dates from 1138. The cloister round the building,

which is quite small, is perfect, and the interior is very dark. At one time there were no windows at all. Over the doorway are runic inscriptions. One runs: "Thorir raist runar thissar than Olaf misso" (Thorir wrote these lines on the fair of St. Olaf). Every part of this veteran church is of fascinating interest—six tiers of pagoda-like, shingle-covered roof, numerous gables from which spring grotesque dragons' heads, and lofty and elaborately carved portals.

A quaint legend is associated with Heidal Stave church. "Some centuries ago," it runs, "a man in pursuit of grouse traversed one of these formerly inhabited, but now almost deserted places. As he shot an arrow at a bird on one of the trees he heard a peculiar sound, as if the arrow had struck against something. Full of curiosity, he approached the place, where, to his astonishment, he came upon an old church. Mindful of the ancient idea that if this was a work of witchcraft it would immediately disappear if brought into contact with steel, he seized his tinderbox and threw it over the church. On the spot where it fell a farmhouse was afterwards built, which to the present day bears the name of *Ildjernstad* (the tinderbox place). After taking this precautionary measure, he proceeded to investigate the church.

"The key stood in the door, which was half open. In the middle of the

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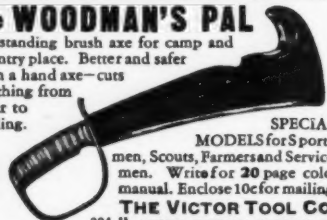
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floor stood a large bell, and at the foot of the altar a great bear had taken up its winter quarters. It was killed by the brave hunter, and its skin was hung up in the church as a memorial of this strange occurrence. In the church he is said to have found, among other things, some pictures, a little brass shrine, four large bells and a small one. It was against one of these that the arrow had struck and produced the sound which attracted his attention. . . ."

The largest surviving Stave church is the one at Hitterdal. It was erected in the thirteenth century, but in the opinion of some the restoring has been overdone. The cloister is nearly complete and compares with the one at Borgund. Another partially modernized Stave church is the one at Ringeby, built during the same century.

The church at Torpe probably dates from the end of the twelfth century and its most striking feature is a splendid western doorway. Opdal is also noted for the skillful carving of its doors. Not very far from Bergen is

Fantoft, where one can visit a beautiful example of the art of the Stave church builders. This one was moved from Fortun on the Sogne Fiord, and possesses massive pillars and runic carvings.

The visitor to these churches cannot fail but be struck with their resemblance to the old Norse galleys. They look like ships on the stocks, and it is more than probable that the shipwrights of those far-off times had a big part in building the Stave churches, for they were the best carpenters of the day. The most impressive feature of all, however, is the carving, which includes the most fantastic designs the imagination could conceive, and all kinds of creatures including birds, beasts, dragons and trees. It is possible that some of the ideas for these were obtained from the Near East, for some Norsemen took part in the Crusades, and dozens of ships made their way to the Holy Land. Thus the "Christian" carvings found on the ancient timbers of Stave churches are inextricably mixed with pagan notions and others from Byzantine sources.

800th Forestry Company Cited

(From page 396)

blanketed the mile-high plateau. Roads were blocked and all transportation halted. Digging out their snowshovels and bulldozers, the lumberjacks cleared the G.I. mill area and continued operation. Snowplows and combined civilian and military work crews shoveled snow on a round-the-clock schedule to clear the narrow gauge rail line out of the mountains. It was two and a half months, however, before the vehicular roadways were reopened. Cutting and shipment of lumber, though dropping below par in volume, continued throughout the period of the heavy snow.

Despite its picturesque setting, the company's remote mountain retreat is no Shangri-La. Hard work and long hours are the formula for harvesting timber in the Sila Mountains. The nearest town of more than a hundred population is separated from the camp by

twenty-five miles of tortuously steep and winding roads, and this curlycue connection with the outer world is blocked by snow drifts two or three months of the year. The G.I. lumberjacks, however, are comfortably housed, clothed and fed, with the ration truck making a daily round trip of 330 miles to the Adriatic coast for provisions. The menus are augmented by the local procurement of fresh vegetables, and colorful Lake Arvo offers a tasty Friday special of speckled lake trout, as well as pleasurable recreation for foresters with time to cast a line.

"Hair on Your Chest" is one of the interpretations given the name of the rugged range of pine-clad mountains—and "hair on your chest" is a characteristic quality of the hardy, hard-working American doughboys of the 800th Forestry Company.



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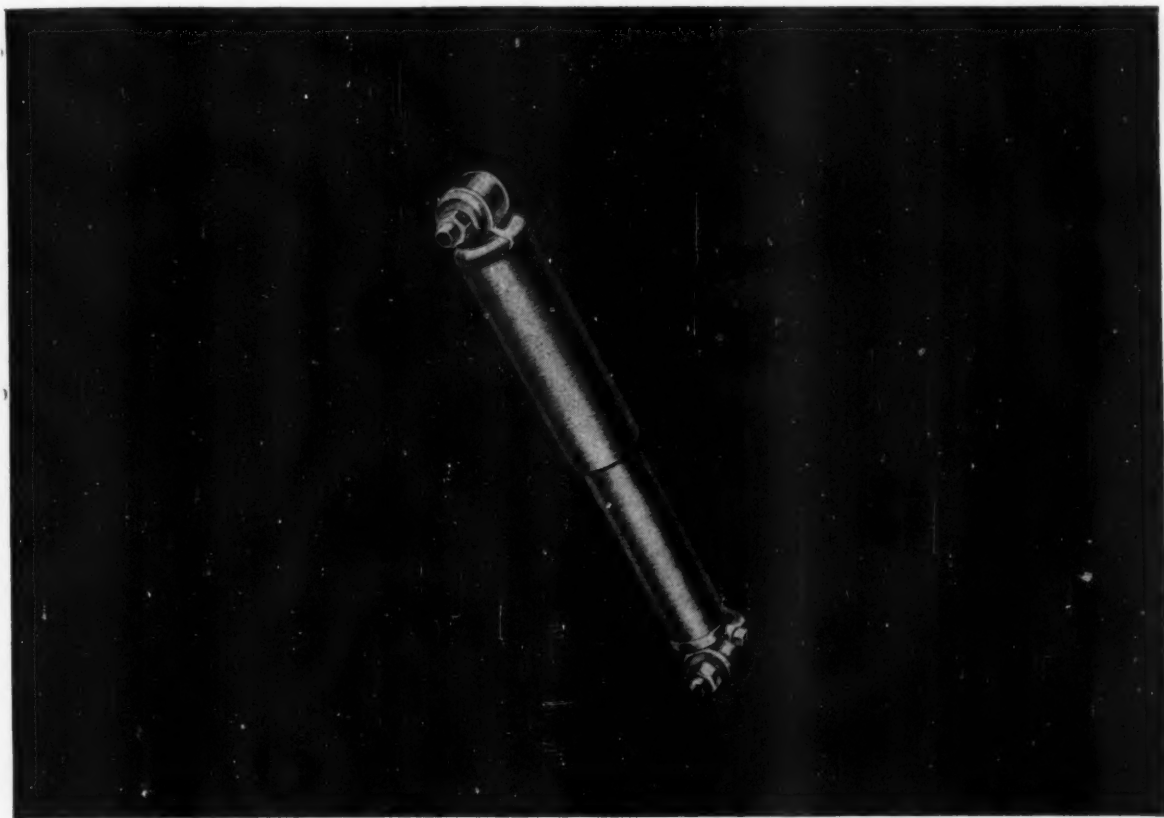


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The Green Lagoons

(From page 377)

water. The lagoons were saline; the river, where we could find it, was too muddy to drink. At each new camp we dug a new well. Most wells, however, yielded only brine from the Gulf. We learned, the hard way, where to dig for sweet water. When in doubt about a new well, we lowered the dog by his hind legs. If he drank freely, it was the signal for us to beach the canoe, kindle the fire, and pitch the tent. Then we sat at peace with the world while the quail sizzled in the Dutch oven, and the sun sank in glory behind the San Pedro Martir. Later, dishes washed, we rehearsed the day, and listened to the noises of the night.

Never did we plan the morrow, for we had learned that in the wilderness some new and irresistible distraction is sure to turn up each day before breakfast. Like the river, we were free to wander.

To travel by plan in the Delta is no light matter; we were reminded of this whenever we climbed a cottonwood for a wider view. The view was so wide as to discourage prolonged scrutiny, especially toward the Northwest, where a white streak at the foot of the Sierra hung in perpetual mirage. This was the great salt desert on which, in 1829, Alexander Pattie died of thirst, exhaustion, and mosquitoes. Pattie had a plan: to cross the Delta to California.

Once we had a plan to portage from one green lagoon to a greener one. We knew it was there by the waterfowl hovering over it. The distance was 300 yards through a jungle of *cachinilla*, a tall spear-like shrub which grows in thickets of incredible density. The floods had bent down the spears, which opposed our passage in the manner of a Macedonian phalanx. We discreetly withdrew, persuaded that our lagoon was the prettier anyhow.

Getting caught in a maze of *cachinilla* phalanxes was a real danger which no one had mentioned, whereas the danger we had been warned against failed to materialize. When we launched our

canoe above the border, there were dire predictions of sudden death. Far huskier craft, we were told, had been overwhelmed by the tidal bore, a wall of water which rages up the river from the Gulf with certain incoming tides. We talked about the bore, we spun elaborate schemes to circumvent it, we even saw it in our dreams, with dolphins riding its crest and an aerial escort of screaming gulls. When we reached the mouth of the river, we hung our canoe in a tree and waited for two days, but the bore let us down. It did not come.

The Delta having no place-names, we had to devise our own as we went. One lagoon we called the Rillito, and it is here that we saw pearls in the sky. We were lying flat on our backs, soaking up November sun, staring idly at a soaring buzzard overhead. Far beyond him the sky suddenly exhibited a rotating circle of white spots, alternately visible and invisible. A faint bugle note soon told us they were cranes, inspecting their Delta and finding it good. At the time my ornithology was home-made, and I was pleased to think them whooping cranes because they were so white. Doubtless they were sandhill cranes, but it doesn't matter. What matters is that we were sharing our wilderness with the wildest of living fowl. We, and they, had found a common home in the remote fastnesses of space and time; we were both back in the Pleistocene. Had we been able to, we would have bugled back their greeting. Now, from the far reaches of the years, I see them wheeling still.

* * *

All this was far away and long ago. I am told the green lagoons now raise canteloupes. If so, they should not lack flavor.

Man always kills the thing he loves, and so we the pioneers have killed our wilderness. Some say we had to. Be that as it may, I am glad I shall never be young without wild country to be young in. Of what avail are forty freedoms without a blank spot on the map?

Candy on Trees

(From page 385)

was the supreme gift from one king to another, or from a lover to his sweetheart. They even knew that rulers guarded Khalasa palms under strict penalty of death. So, they did a characteristic thing; they sent a secret expedition.

Privately owned and financed, it posed as a geological party and thereby gained admission to the date growing

regions. Thirty camels were used to carry camp equipment and tools. Two pseudo-scientists from California dug into the earth and bluffed at length while curious Arabs stared. Then, at night, the Americans would slip into gardens past armed guards, chisel Khalasa offshoots from mother trees, take them back to camp and conceal them. Nearly 200 thus were snatched when the party

ATTENTION: MEMBERS AND FRIENDS OF THE ASSOCIATION

WE are deeply interested in having your ideas and suggestions as to how your magazine, AMERICAN FORESTS, can be more helpful to you in the many years of outdoor life before you.

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Here, then, is your opportunity to give us greatly needed data about yourself, your activities and how we can help you with them. Let's work together to make our forests more useful, more enjoyable and better appreciated. Below, and on the reverse of this page, you will find a detailed questionnaire. Please fill it in fully on both sides and mail it back to us today!

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GIVE US YOUR IDEAS AND SUGGESTIONS

(CUT HERE)

1. (A) Check which of the following articles you have read—*thoroughly* (note as "T"); those which you have merely *scanned* (note as "S"); and those which you *did not read at all* (note as "N"). (B) Mark with an "X" in the column provided, the *three* articles which interested you most. There should be a "T", "S" or "N" for each article.

"X" "TSN"

() Forest Exchange 370
() My Favorite Tree 373
() Editorial 375
() The Green Lagoons 376
() Russia's Forests 378
() Where Shall We Find
Enough Cellulose? 380

"X" "TSN"

() Lumber for Europe 383
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Churches of Norway 392

"X" "TSN"

() Maryland's Homespun
Forestry 394
() Forestry Company
Cited 396
() Tarheel Fire Trailer 398
() Around the States 400

Of all the articles you have ever read in AMERICAN FORESTS which one did you like:

Best?

Next Best?

2. As a reader of AMERICAN FORESTS, we assume that you have a genuine appreciation for the forests. Please check the following subjects in which you have a "Reading" and/or "Doing" interest.

D R Visiting new forests

D R Visiting historic places

D R Visiting National Parks

D R Visiting Ghost areas

D R Unusual Regions

D R Viewing forest scenes

D R Forest Biographies

D R Forestry biographies

D R Forest reminiscences

D R Forestry reminiscences

D R Finding unusual trees

D R Forests of other lands

D R Estates and their care

D R Return to Land movement

D R Paul Bunyan tales

D R Logging tales and legends

D R Forest adventures

D R Forest fiction

D R Forest-inspired poetry

D R Seasonal forest aspects

D R Logging camp recipes

D R Forestry news and progress

D R Reviews of forest movies

D R Science and Equipment news

D R Forestry books and pamphlets

D R Readers Forum

D R

(Over)

started its return journey. And then—is Hollywood listening?—out of the night the Arabs attacked!

With flashing blades the warriors of the princes, who hadn't been duped for long, swept down on the Americans and their native helpers. Men were screaming, running, dying; the caravan was dispersed and at least four of the camelteers killed. The Americans, on the fastest camels, escaped. And eventually they arrived back home with five of the Khalasa offshoots.

Planted date seeds do not produce worthwhile trees, and there is no grafting or budding as with many fruits. Offshoots, also called "suckers," must be removed with great care from the base of the female tree and planted in the spring. These in turn will produce five to twenty-five offshoots during their first five years of life, and each offshoot is worth five dollars and up. Thus comes important financial return during a period when most orchards are a dead loss.

Blooms are tiny and have no fragrance or nectar, hence bees ignore them. Human hands must cut sprigs of male blossoms and tie over each bunch of the female. Later in spring about half the green fruit must be picked off to avoid crowding and increase size.

Then when color starts turning, in early fall, a cloth must be put around each fruit cluster to keep out rain and to thwart hungry birds. It is left open at the bottom to be lifted at picking time.

To do all this work you must climb a slender, shivery ladder up to seventy feet and stand on a little platform supported by stilts or swung by wires from the tree itself. While these tall palms are picturesque against the western skies, the breezes swish them and you around, dangerously. Wasps and hornets think them ideal for homing, hence you may find one or a dozen nests in any palm, and added zest comes from the fact that every frond and fruit stem is studded with thorns six inches long, and sharp as Arab daggers.

Fresh ripe dates grow up to three inches long and half that thick, and range in color from a translucent tan to maroon to black. Their soft-candy deliciousness makes them more nearly a confection than a staple in our country. And fresh ones must by no means be confused with the dried or processed imports. Fortunately, ways were discovered whereby our dates can be shipped and kept for months in approximately their fresh condition.

Each acre of American dates has a

potential average of 10,000 pounds of fruit, worth an average of fifty cents a pound. Production costs half that, but there is still a net of \$2,500 an acre. The one outstanding date man in America is Colonel Dale Bumstead in Arizona. It was he who paid a blockade runner's price for the snatched Khalasa offshoots' progeny, and from them developed five acres called the most valuable farm plot of its size in America. Today he is a wealthy hobbyist-experimenter with dates.

Archaeologists have found pictures of date palms on the excavated Temple of the Moon dating 7,000 years ago, and many papyrus records of dates used in the 12th century B.C.

In those centuries, as now, dates were eaten by human beings, monkeys and camels. Many a desert dweller has thrived for months on no food save dates and goat's milk, and in olden times armies there fought and conquered on this fare. Date stones are ground into a meal, also are used by children to play games. Date blossoms are made into a beverage, stale fruit converted into sugar, leaves woven into household articles. Where it grows at all, the date palm is worth more for food and barter than all the cotton, grain, or meat.

3. In pursuing your anticipated postwar recreational, educational and other normal travel activities, which vehicles will you use, whenever possible, to get there and back? (Please fill in or check only such trip-lengths as you actually hope to take.)

Round Trips BY PLANES TRAINS BUSES AUTOS BOATS _____
 of 1,000 miles or longer _____
 of 250-1,000 miles _____
 of less than 250 miles _____
 Trips for the day _____
 How many weeks per year will you spend on such trips? _____ # Going _____ # Adults _____ # Children _____
 If you travel by train, will the trips involve Sleepers _____ Chair Cars _____ Coaches _____

ACCOMMODATIONS

Which types of accommodation do you plan to use for such trips? Hotels _____ Tourist Camps _____
 Tourist Homes _____ Trailers _____ Outdoors _____ Stay with friends _____ Others: _____
 Remarks: _____

Name _____ Address _____ City _____ State _____
 Age _____ yrs. Married or single _____ Children under 12 _____ Children over 12 _____ Adults in Family _____
 Income: "A" (\$1000-\$2500) _____; "B" (\$2600-\$5000) _____; "C" (\$5000-\$7500) _____; Over \$7500 _____
 Training _____ Character of present work _____
 Personal Hobby or Avocation _____ Family Hobby or Avocation _____
 If your personal income were increased 15%, what would you do with the increase? _____

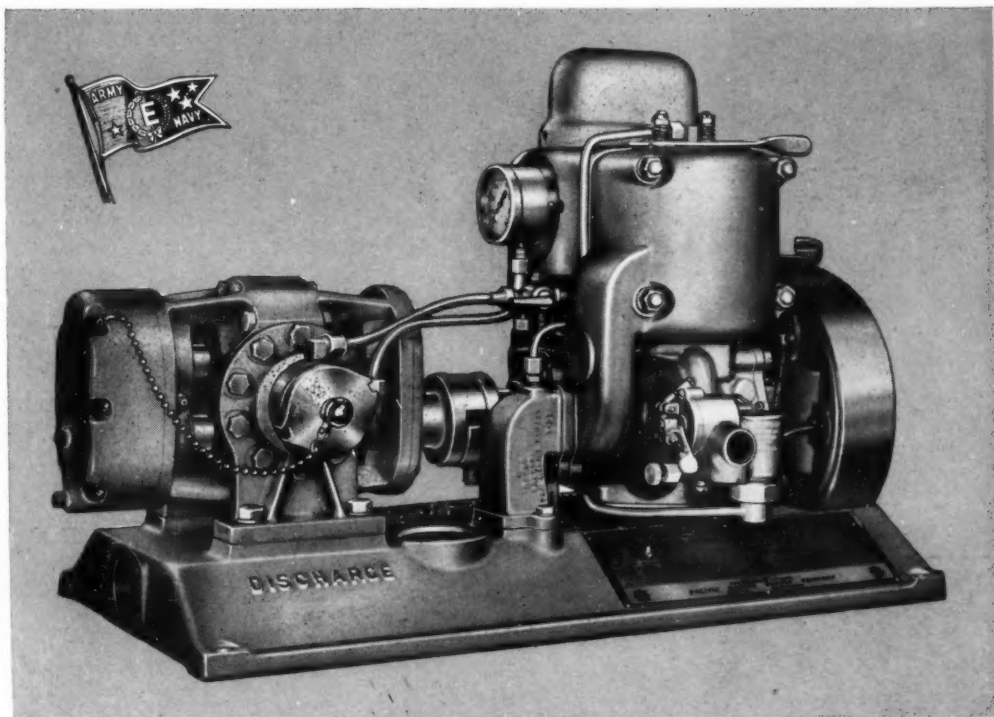
Do you own your own home _____; automobile(s) _____; horse _____; forest or woodland _____
 Other property _____

Thank you. Be sure you answered all questions fully and then tear out bottom half of this page and return it to:

THE AMERICAN FORESTRY ASSOCIATION
 919 17th Street, Northwest, Washington 6, D. C.

TYPE "Y"

Portable Pumper



While the major part of our manufacturing effort still is confined to production for the Navy, we once again are able to produce a limited quantity of our highly specialized fire-fighting Type "Y" Portable Pumps for the forestry service, industrial plants and commercial shipping.

For weight and size, Pacific Marine Type "Y" is the most powerful portable pumper yet built. Base, 24 x 12 inches; height, 13 inches; net weight complete, ready to operate, 70 pounds.

CAPACITY

PRESSURE	100	125	150	175	200	225
GALLONS PER MINUTE	63	59	53	46	40	20

Manufactured by the FIRE-FIGHTING EQUIPMENT DIVISION of the
PACIFIC MARINE SUPPLY COMPANY
SEATTLE, Washington

THIS IS ONE WAY TO PUT OUT A FIRE..

*But there's a
Better Method*

This Bettman Archive print shows cowboys dragging a bull's hide across a blazing prairie fire in Northern Texas. From a painting by the famous artist Frederick Remington.



INDIAN

*Fire
Pumps*

DO THE JOB QUICKER AND EASIER!

Use them to stop troublesome Autumn fires!

Picturesque as the above means of fire extinguishing may be, it scarcely would serve to control forest, grass, rubbish or building fires effectively. The modern way is to use plenty of clear water **INDIAN FIRE PUMPS**—the portable, one man fire departments.

Sling an **INDIAN FIRE PUMP** on the back and you are ready for fast action... easy pumping throws 30 to 50 ft. pressure stream. Tank carries high on shoulders like the Army pack. Will not rub or chafe the hips.

**Send for Catalog
and Full Details**

"Likes Indians Best"

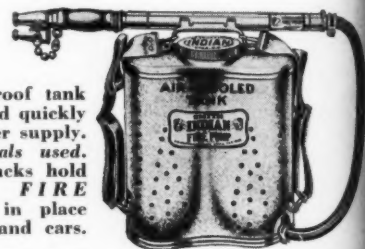
D. B. Smith & Co.
Utica, N. Y.

Gentlemen:

We have been using **INDIAN FIRE PUMPS** for several years in our camp and like them so much better than other types of extinguishers that we are sending you an order for three more **INDIAN FIRE PUMPS**. Please ship as soon as possible.

Yours very truly,

WOODCRAFT CAMP.
W. A. Hardike, Director.



Big rust proof tank can be filled quickly at any water supply. No chemicals used. Carrying racks hold **INDIAN FIRE PUMPS** in place on trucks and cars.



Day or night, fire fighters with **INDIAN FIRE PUMPS** halt all types of grass, forest, field, building and Class A fires before they spread.

D. B. SMITH & CO., 405 Main St. UTICA, N. Y.

PACIFIC COAST BRANCHES

Hardware Equipment & Supply Co., 422 Brannan St., San Francisco, Cal.

Wm. B. Doyle Co.
100 W. Third St.

Carr-Saunders Co.
222 S.W. Fifth St.

The Campbell Co.
Eleventh Falls

W.H. & Wm. Smith
2204 Fourth Ave. St.



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